# ARCHITECTURE

REG. U. S. PAT. OFFICE

THE PROFESSIONAL ARCHITECTURAL MONTHLY

VOLUME LXVII

~~DECEMBER~~—JUNE

1933



NEW YORK

CHARLES SCRIBNER'S SONS

1933

# INDEX

## VOLUME LXVII: JANUARY THROUGH JUNE, 1933

*The pagination of the volume is divided as follows: Jan., 1–62; Feb., 63–122; Mar., 123–184; Apr., 185–246; May, 247–308; June, 309–370*


Administration Bldg., Veterans' Home, Rocky Hill, Hartford, Conn.; Douglas Orr, archt.: 13
Adventures of Huckleberry Finn, painted by D. Putnam Brinley: 151
Air conditioning: Fair Weather, by Carleton B. Ryder: 31
Aldrich, William T., archt.: Worcester Art Museum, Worcester, Mass.: 155. Proposed Munger Hall, Wellesley College, Wellesley, Mass.: 155
All Souls Unitarian Church, New York City; Hobart B. Upjohn, archt.: 13
Allen & Collens, archts.: City Hall, Newton, Mass.: 13
Alsatian House in Fredericksburg, Texas, Old, from the pencil drawing by Edward M. Schiwetz: 253
Alschuler, Alfred S., assoc. archt.; Schmidt, Garden & Erikson, archts.: Mount Sinai Hospital, Chicago: 86
American Philosophical Society's Bldg., Proposed, Philadelphia; Paul P. Cret, archt.: 277
Apartments: Van Tassel, North Tarrytown, N. Y.: Jan. *Frontis.* Interiors, Public Rooms, Park Plaza, St. Louis, Mo.: 279
Arch of Constantine, from the pencil drawing by Burton Kenneth Johnstone: 225
Architectural League Exhibit, The, New York City: 211
Architectural News in Photographs: 12, 154, 276
Architectural Observer, The: 227
Are We Ready for an American Housing Advance?, by Henry Wright: 309

Balusters, English: 317
Bank Screens: A Portfolio of: 47
Banks: Proposed Federal Reserve Bldg., Philadelphia: 155. Providence National, Providence, R. I.: 157. Dime Savings Bldg., Brooklyn, N. Y.: 277
Bartels, W. F.: Some Pitfalls in Supervision: XXVII. Ornamental Iron and Bronze, Cont.; Hardware: 37. XXVIII. Hardware, Cont.; Roofing and Sheet Metal: 101. XXIX. Roofing and Sheet Metal, Cont.: 165. XXX. Roofing and Sheet Metal, Cont.; Mechanical Appurtenances: 223. XXXI. Mechanical Appurtenances, Cont.: 283. XXXII. Mechanical Appurtenances, Cont.: 351
Basilica Patriarcal, Monterrey, Mexico, from the pencil drawing by Edward M. Schiwetz: 254
Benjamin Franklin Memorial and Franklin Institute Museum, Philadelphia; John T. Windrim, archt.: 276
Bercovici, Rion: Selling Architectural Services Today: 228
Blair, Walter D.; Taylor & Fisher; Peebles & Ferguson, archts.: Clark Memorial Hall, University of Virginia: 12
Book Reviews: 42, 106, 156, 216, 278, 332
Boyd, Rutherford: The Ratio-Envelope of Form: 7. Can We Invent New Forms?: 323
Brein, John David, sculptor: Joslyn Memorial, Omaha, Neb.: 99
Brinley, D. Putnam, painter: The Adventures of Huckleberry Finn: 151
Brown, Lewis H.: A Constructive Policy for the Construction Industry: 353

Can We Invent New Forms?, by Rutherford Boyd: 323
Carter's Grove, The Renascence of, on the James River, Virginia; W. Duncan Lee, archt.: 185
Charcoal Drawings: New York Hospital-Savannah, Ga.; Schmidt, Garden & Erikson, archts.: 71
Century of Progress, Chicago: Proposed Hall of Religion: 155
Charcoal Drawing: New York Hospital-Cornell Medical College Association Group: March *Frontis.*
Chatham Village, Pittsburgh; Ingham & Boyd, archts.; Clarence S. Stein and Henry Wright, consulting archts.: 12
Chinese Y. W. C. A. Bldg., San Francisco; Julia Morgan, archt.: 195
Christian Science Publishing Society's Bldg., Boston; Chester Lindsay Churchill, archt.: 276
Chrystie, E. P.: Drawing in Charcoal, New York Hospital-Cornell Medical College Association Group: March *Frontis.*
Churches: All Souls Unitarian, New York City: 13. Stained Glass for Night and Day, St. Paul's, Chestnut Hill, Pa.: 164. Utrecht Cathedral, 1929: May *Frontis.*
Churchill, Chester Lindsay, archt.: Christian Science Publishing Society's Bldg., Boston, 276
City Hall, Newton, Mass.; Allen & Collens, archts.: 13
Clark Memorial Hall, University of Virginia; Walter D. Blair; Taylor & Fisher; Peebles & Ferguson, archts.: 12
Clute, Eugene, Lamination in Metal Work: 265
Coate, Roland E., archt.: House of Herbert Allen, Jr., Los Angeles, Calif.: 167. House of Edward H. Heath, San Marino, Calif.: 343
Comparative Costs: 45
Construction Industry, A Constructive Policy for the, by Lewis H. Brown: 353
Constructive Policy for the Construction Industry, by Lewis H. Brown: 353
Contacts: 45, 353
Corbett, Harvey Wiley, and D. Everett Waid, archts.: Metropolitan Life Insurance Co.'s Home Office Bldg., New York City: 12, 276
Cornwell, Dean, painter: Murals for Los Angeles Public Library: 327
Craftsmanship in Hand-wrought Hardware, Today's, by Gerald K. Geerlings: 15
Cram & Ferguson and Samuel E. Lunden, assoc. archts.: The Edward L. Doheny, Jr. Memorial Library, University of Southern California: 12
Cret, Paul P., archt.: Proposed Federal Reserve Bank Bldg., Philadelphia: 155. Proposed American Philosophical Society's Bldg., Philadelphia: 277

D'Ascenzo Studios, The, craftsmen, in conjunction with Zantzinger, Borie & Medary, archts.: Stained Glass for Night and Day, St. Paul's Church, Chestnut Hill, Pa.: 164
Davis, Dunlap & Barney, archts.: House of Edward Wright, Moylan, Pa.: 347
Delano & Aldrich, archts.: Yale Divinity School, New Haven, Conn.: 269
Delk, Edward Buehler, archt.: House of Dr. Thomas G. Orr, Kansas City, Mo.: 285
Designer's Notes on Low-cost Multi-family Housing, A, by Thomas C. Stapleton: 1
Dime Savings Bank Bldg., Brooklyn, N. Y.; Halsey, McCormack & Helmer, Inc., archts.: 277
Doheny, Jr. Memorial Library, The Edward L., University of Southern California; Cram & Ferguson and Samuel E. Lunden, assoc. archts.: 12
Doors, Interior; A Portfolio of: 107
Drawing as a Basis for Etching, by Gerald K. Geerlings: 261

Eagle in Sculpture, The, A Portfolio of: 293
Editor's Diary, The: 43, 103, 161, 213, 289, 340
Ekman, Holm & Co., archts. and engrs.: Proposed Federal House of Detention, Sandstone, Minn.: 154
Embury II, Aymar, archt.: House of O. F. Miller, Kalamazoo, Mich.: 25
English Balusters: 317
Erikson, Carl A.: The Hospital, Today and Tomorrow: 63
Etching, Drawing as a Basis for, by Gerald K. Geerlings: 261
Etching, soft-ground, "Inland Islands," by Gerald K. Geerlings: June *Frontis.*
Etching, Soft-ground—The Architect's Medium, by Gerald K. Geerlings: 333

Fair Weather, by Carleton B. Ryder: 31
Favorite Features: 339
Federal House of Detention, proposed, Sandstone, Minn.; Ekman, Holm & Co., archts. and engrs.: 154
Federal Reserve Bank Bldg., proposed, Philadelphia; Paul P. Cret, archt.: 155

SEP 27 1933

# INDEX—ARCHITECTURE—Vol. LXVII


Fenichel, Irving M., archt.: Knickerbocker Laundry Co., Long Island City: 12
Fisher, Ernest M.: The Minimum House: 45
Floating a Sketch, by Fred R. Lorenz: 11
Forms?, Can We Invent New, by Rutherford Boyd: 323

Gables, Eaves Returns on Masonry, A Portfolio of: 355
Garfield Park Hospital, Chicago; Schmidt, Garden & Erikson, archts.: 69
Geerlings, Gerald K.: Today's Craftsmanship in Hand-wrought Hardware: 15. Photographs and captions, Parisian and Dutch Shop Fronts: 131. Pencil drawing, Utrecht Cathedral, 1929: May *Frontis*. Drawing as a Basis for Etching: 261. "Inland Islands," soft-ground etching: June *Frontis*. Soft-ground Etching—the Architect's Medium: 333
Gilbert, Cass, archt.: Proposed United States Legation and Consular Bldg., Ottawa, Canada: 155. Sundial, Shakespeare's garden, Stratford-on-Avon: 277
Goldwater, M.D., S. S., consultant with Schmidt, Garden & Erikson, archts.: Valley Hospital, Sewickley, Pa.: 74
Goldwater, M.D., S. S., hospital consultant with Schmidt, Garden & Erikson, archts.; Henry Hornbostel, consulting archt.: Montefiore Hospital, Pittsburgh: 81
Green & Son, Edward B., archts.: Toledo Museum of Art, Toledo, O.: 154

Hall & Proetz, archts.: Interiors, Public Rooms of the Park Plaza, St. Louis, Mo.: 279
Hall of Religion, proposed, Century of Progress Exposition, Chicago; Thielbar & Fugard, archts.: 155
Halsey, McCormack & Helmer, Inc., archts.: Dime Savings Bank Bldg., Brooklyn, N. Y.: 277
Hardware, Today's Craftsmanship in Hand-wrought, by Gerald K. Geerlings.: 15
Hewitt & Brown, archts.: The Creation of a Telephone Bldg., Minneapolis: 199
Hewlett, James Monroe, painter: Providence National Bank, Providence, R. I.: 160
Holey, Dr. Karl, archt.: Ein Landhaus, Hang, South Tirol: 331
Hornbostel, Henry, consulting archt.; Schmidt, Garden & Erikson, archts.; S. S. Goldwater, M.D., hospital consultant: Montefiore Hospital, Pittsburgh: 81
Hospital, Today and Tomorrow, The, by Carl A. Erikson: 63
Hospitals: Michael Reese, Chicago: 64. Garfield Park, Chicago: 69. St. Catharine's, Kenosha, Wis.: 70. Central of Georgia Railway Co., Savannah, Ga.: 71. St. Mary's, Saginaw, Mich.: 72. Valley, Sewickley, Pa.: 74. Ponca City Hospital of the Sisters of St. Joseph, Ponca City, Okla.: 76. Leila Y. Post Montgomery Hospital of the Sisters of Mercy and Werstein Nurses' Home, Battle Creek, Mich.: 78. Montefiore, Pittsburgh: 81. Salvation Army Hospital for Women, Chicago: 85. Mount Sinai, Chicago: 86. Swedish Covenant, Chicago: 88. Washington, Washington, Pa.: 89. New York Hospital-Cornell Medical College Association Group: March *Frontis*.
House, The Minimum, by Ernest M. Fisher: 45
Houses: Of Le Roy Kellogg, Pasadena: 21. Of O. F. Miller, Kalamazoo, Mich.: 25. Interiors, London: 39. Of Benjamin D. Mosser, Mendham (Morristown), N. J.: 137. Of Herbert Allen, Jr., Los Angeles, Calif.: 167. Carter's Grove, on the James River, Virginia: 185. Of Vincent Astor, New York City: 217. Old Alsatian House in Fredericksburg, Texas: 253. Of Dr. Thomas G. Orr, Kansas City, Mo.: 285. Ein Landhaus, Hang, South Tirol: 331. Chimney corner, house of Constantine Hutchins, Needham, Mass.: 339. Of Edward H. Heath, San Marino, Calif.: 343. Of Edward Wright, Moylan, Pa.: 347
Housing, A Designer's Notes on Low-cost Multi-family, by Thomas C. Stapleton: 1
Housing, The Sad Story of American, by Henry Wright: 123
Housing Advance?, Are We Ready for an American, by Henry Wright: 309
Howe & Church, archts.: Providence National Bank, Providence, R. I.: 157
Hutzler Brothers Store, Baltimore; Joseph Evans Sperry, archt.: 13

Indiana World War Memorial, Indianapolis, Ind.; Walker & Weeks, archts.: 13
Infirmary Bldg., Veterans' Home, Rocky Hill, Hartford, Conn.; Douglas Orr, archt.; Carl J. Malmfeldt, consulting archt.: 13
Ingham & Boyd, archts.; Clarence S. Stein and Henry Wright, consulting archts.: Chatham Village, Pittsburgh: 12
"Inland Islands," soft-ground etching, by Gerald K. Geerlings: June *Frontis*.
Insurance Co. of North America Bldg., proposed New York City; Shreve, Lamb & Harmon, archts.: 154
Interior Doors, A Portfolio of: 107
Interiors—Public Rooms of the Park Plaza, St. Louis, Mo.; Hall & Proetz, archts.: 279

Johnstone, Burton Kenneth: Pencil drawing, Arch of Constantine: 225. Pencil drawing, Market Square, Nuremburg: 226
Jones, Thomas Hudson, sculptor: Tomb of the Unknown Soldier, Arlington, Va.: 255

Keefe, Charles S., archt.: A chimney corner, house of Constantine Hutchins, Needham, Mass.: 339
Klauder, Charles Z., archt.: Tower of Learning, University of Pittsburgh: 12
Knickerbocker Laundry Co., Long Island City; Irving M. Fenichel, archt.: 12

Lee, W. Duncan, archt.: The Renascence of Carter's Grove, on the James River, Virginia: 185
Leila Y. Post Montgomery Hospital of the Sisters of Mercy and Werstein Nurses' Home, Battle Creek, Mich.; Schmidt, Garden & Erikson, archts.: 78
Libraries: The Edward L. Doheny, Jr. Memorial, University of Southern California: 12. Murals for Los Angeles Public, Los Angeles: 327
Light and Optics: Material Vision, by Carleton B. Ryder: 93
Lighting fixtures, Rockefeller Center, New York City: 153
Lorenz, Fred R.: Floating a Sketch: 11
Loven, Carl: Pencil drawing, Wash Sheds on the River Eure, Chartres: Feb. *Frontis*.
Lunden, Samuel E., and Cram & Ferguson, assoc. archts.: The Edward L. Doheny, Jr. Memorial Library, University of Southern California: 12
Lutyens. Robert, and Robert W. Symonds, designers: Interiors of a London House: 39

Malmfeldt, Carl J., consultant with Douglas Orr, archt.: Infirmary Bldg., Veterans' Home, Rocky Hill, Hartford, Conn.: 13
Material Vision, by Carleton B. Ryder: 93
McDonald, John and Alan, archts.: Joslyn Memorial, Omaha, Neb.: 99
McKim, Mead & White, archts.: Proposed Annex to Post Office, New York City: 276
Memorials: The Edward L. Doheny, Jr. Mem. Library, University of Southern California: 12. Clark Mem. Hall, University of Virginia: 12. Indiana World War Mem., Indianapolis, Ind.: 13. Joslyn Mem., Omaha, Neb.: 99. Benjamin Franklin Mem., Philadelphia: 276
Metal Work, Lamination in, by Eugene Clute, 265
Metropolitan Life Insurance Co.'s Home Office Bldg., New York City; D. Everett Waid and Harvey Wiley Corbett, archts.: 12, 276
Michael Reese Hospital, Chicago; Schmidt, Garden & Erikson, archts.: 64
Minimum House, The, by Ernest M. Fisher: 45
Montefiore Hospital, Pittsburgh; Schmidt, Garden & Erikson, archts.; Henry Hornbostel, consulting archt.; S. S. Goldwater, M.D., hospital consultant: 81
Morgan, Julia, archt.: Chinese Y. W. C. A. Bldg., San Francisco: 195
Mount Sinai Hospital, Chicago; Schmidt, Garden & Erikson, archts.; Alfred S. Alschuler, assoc. archt.: 86
Munger Hall, proposed, Wellesley College, Wellesley, Mass.; William T. Aldrich, archt.: 155
Mural Paintings: The Adventures of Huckleberry Finn: 151. Providence National Bank, Providence, R. I.: 160. Los Angeles Public Library, Los Angeles: 327
Museums: Worcester Art, Worcester, Mass.: 155. Franklin Institute, Philadelphia: 276

New York Hospital-Cornell Medical College Association Group, from the drawing in charcoal by E. P. Chrystie: March *Frontis*.
Nuremburg, Market Square, from the pencil drawing by Burton Kenneth Johnstone: 226

Office Buildings: Metropolitan Life Insurance Co.'s Home Office Bldg., New York City: 12. Parliament Bldgs., Northern Ireland: 154. Proposed United States Customs House and Appraisers Stores Bldg., Philadelphia: 154. Proposed Insurance Co. of North America Bldg., New York City: 154. Telephone Bldg., Minneapolis: 199. Christian Science Publishing Society's Bldg.: 276. Metropolitan Life Insurance Co.'s Home Office Bldg., New York City: 276
Oliver, Marshal Leslie: The Way Out: 247
Organic Structure, by Carleton B. Ryder: 145
Orr, Douglas, archt.: Administration Bldg., Veterans' Home, Rocky Hill, Hartford, Conn.: 13
Orr, Douglas, archt.; Carl J. Malmfeldt, consulting archt.: Infirmary Bldg., Veterans' Home, Rocky Hill, Hartford, Conn.: 13

Parisian and Dutch Shop Fronts; Photographs and captions by Gerald K. Geerlings: 131
Parliament Bldgs., Northern Ireland; Sir Arnold Thornely, archt.: 154
Peebles & Ferguson; Walter D. Blair; Taylor & Fisher, archts.: Clark Memorial Hall, University of Virginia: 12
Pencil Drawings: Wash Sheds on the River Eure, Chartres: February *Frontis*. Arch of Constantine: 225. Market Square, Nuremburg: 226. Utrecht Cathedral, 1929: May *Frontis*. Old Alsatian House in Fredericksburg, Texas: 253. Basilica Patriarcal, Monterrey, Mexico: 254




YALE SCHOOL OF THE FINE ARTS 6110

Photographic Study, A; Robert MacLean Glasgow: 275
Ponca City Hospital of the Sisters of St. Joseph, Ponca City, Okla.; Schmidt, Garden & Erikson, archts.: 76
Portfolios: Bank Screens: 47. Interior Doors: 107. Stair Railings: 169. Verandas: 231. The Eagle in Sculpture: 293. Eaves Returns on Masonry Gables: 355
Post Office, Annex to, Proposed, New York City; McKim, Mead & White, archts.: 276
Providence National Bank, Providence, R. I.; Howe & Church, archts.: 157
Public-works program, The Way Out, by Marshal Leslie Oliver: 247

Rasmussen & Wayland, archts.: School bldg., Florham Park, Madison, N. J.: 277
Ratio-Envelope of Form, The, by Rutherford Boyd: 7
Restaurant, "Eat in the Hat," Los Angeles: 277
Rich, Lorimer, archt.: Tomb of the Unknown Soldier, Arlington, Va.: 255
Rickard, Greville, archt.: House of Benjamin D. Mosser, Mendham (Morristown), N. J.: 137
Ritter & Shay, archts.: Proposed United States Customs House and Appraisers Stores Bldg., Philadelphia: 154
Rockefeller Center, New York City: Lighting fixtures: 153
Ryder, Carleton B.: Fair Weather: 31. Material Vision: 93. Organic Structure: 145

Sad Story of American Housing, The, by Henry Wright: 123
St. Catharine's Hospital, Kenosha, Wis.; Schmidt, Garden & Erikson, archts.: 70
St. Mary's Hospital, Saginaw, Mich.; Schmidt, Garden & Erikson, archts.: 72
St. Paul's Church, Chestnut Hill, Pa., Stained Glass for Night and Day; Zantzinger, Borie & Medary, archts.; D'Ascenzo Studios, designers: 164
Salvation Army Hospital for Women, Chicago; Schmidt, Garden & Erikson, archts.: 85
Scheide, Inc., Lester Beach, archts.: Model of Old State House Square, Hartford, Conn., made by Elizabeth Judd Scheide: 276
Schiwetz, Edward M.: Pencil drawing, Old Alsatian House in Fredericksburg, Texas: 253. Pencil drawing, Basilica Patriarcal, Monterrey, Mexico: 254
Schmidt, Mott B., archt.: House of Vincent Astor, New York City: 217
Schmidt, Garden & Erikson, archts.: Michael Reese Hospital, Chicago: 64. Garfield Park Hospital, Chicago: 69. St. Catharine's Hospital, Kenosha, Wis.: 70. Central of Georgia Railway Co. Hospital, Savannah, Ga.: 71. St. Mary's Hospital, Saginaw, Mich.: 72. Ponca City Hospital of the Sisters of St. Joseph, Ponca City, Okla.: 76. Leila Y. Post Montgomery Hospital of the Sisters of Mercy and Werstein Nurses' Home, Battle Creek, Mich.: 78. Salvation Army Hospital for Women, Chicago: 85. Swedish Covenant Hospital, Chicago: 88. Washington Hospital, Washington, Pa.: 89
Schmidt, Garden & Erikson, archts.; Alfred S. Alschuler, assoc. archt.: Mount Sinai Hospital, Chicago: 86
Schmidt, Garden & Erikson, archts.; S. S. Goldwater, M.D., consultant: Valley Hospital, Sewickley, Pa.: 74
Schmidt, Garden & Erikson, archts.; Henry Hornbostel, consulting archt.; S. S. Goldwater, M. D., hospital consultant: Montefiore Hospital, Pittsburgh: 81
Schools and Colleges: Tower of Learning, University of Pittsburgh: 12. Clark Memorial Hall, University of Virginia: 12. The Edward L. Doheny, Jr. Memorial Library, University of Southern California: 12. Proposed Munger Hall, Wellesley College, Wellesley, Mass.: 155. Yale Divinity, New Haven, Conn.: 269. Florham Park, Madison, N. J.: 277
Sculpture on Joslyn Memorial, Omaha, Neb.; John David Brcin, sculptor; John and Alan McDonald, archts.: 99
Selling Architectural Services Today, by Rion Bercovici: 228
Shoe repairing bldg., Portland, Ore.: 277
Shop Fronts, Parisian and Dutch; Photographs and captions by Gerald K. Geerlings: 131
Shops: Hutzler Brothers, Baltimore: 13
Shreve, Lamb & Harmon, archts.: Proposed Insurance Co. of North America Bldg., New York City: 154
Soft-ground Etching—the Architect's Medium, by Gerald K. Geerlings: 333
Some Pitfalls in Supervision, by W. F. Bartels: XXVII. Ornamental Iron and Bronze, Cont.; Hardware: 37. XXVIII. Hardware, Cont.; Roofing and Sheet Metal: 101. XXIX. Roofing and Sheet Metal, Cont.: 165. XXX. Roofing and Sheet Metal, Cont.; Mechanical Appurtenances: 223. XXXI. Mechanical Appurtenances, Cont.: 283. XXXII. Mechanical Appurtenances, Cont.: 351
Sperry, Joseph Evans, archt.: Hutzler Brothers Store, Baltimore: 13
Stained Glass for Night and Day, St. Paul's Church, Chestnut Hill, Pa.; The D'Ascenzo Studios, craftsmen; Zantzinger, Borie & Medary, archts.: 164
Stair Railings, Metal; A Portfolio of: 169
Stapleton, Thomas C.: A Designer's Notes on Low-cost Multi-family Housing: 1
State House Square, Old, Model of, Hartford, Conn.; Lester Beach Scheide, Inc., archts.; made by Elizabeth Judd Scheide: 276
Stein, Clarence S. and Henry Wright, consulting archts.; Ingham & Boyd, archts.: Chatham Village, Pittsburgh: 12
Stewart, Jack G.: Working Drawings: XXXII. Casement and D. H. Window in Frame Wall: 41. XXXIII. Various Swimming Pool Sections: 104. XXXIV. Various Skylight Construction Details: 162. XXXV. Various Residential Eave Details: 215. XXXVI. Various Residential Watertables: 290. XXXVII. Detail of Bar Construction: 342
Sundial, Shakespeare's garden, Stratford-on-Avon; Cass Gilbert, designer: 277
Supervision, Some Pitfalls in, by W. F. Bartels: XXVII. Ornamental Iron and Bronze, Cont.; Hardware: 37. XXVIII. Hardware, Cont.; Roofing and Sheet Metal: 101. XXIX. Roofing and Sheet Metal, Cont.: 165. XXX. Roofing and Sheet Metal, Cont.; Mechanical Appurtenances: 223. XXXI. Mechanical Appurtenances, Cont.: 282. XXXII. Mechanical Appurtenances, Cont.: 351
Swedish Covenant Hospital, Chicago; Schmidt, Garden & Erikson, archts.: 88
Symonds, Robert W., and Robert Lutyens, designers: Interiors of a London House: 39

Taylor & Fisher; Peebles & Ferguson; Walter D. Blair, archts.: Clark Memorial Hall, University of Virginia: 12
Telephone Bldg., The Creation of a, Minneapolis; Hewitt & Brown, archts.: 199
Terra-cotta, The Making of: 207
Thielbar & Fugard, archts.: Proposed Hall of Religion, Century of Progress, Chicago: 155
Thomas, Andrew J., archt.: Van Tassel Apts., North Tarrytown, N. Y.: Jan. *Frontis.*
Thornely, Sir Arnold, archt.: Parliament Bldgs., Northern Ireland: 154
Today's Craftsmanship in Hand-wrought Hardware, by Gerald K. Geerlings: 15
Toledo Museum of Art, Toledo, O.; Edward B. Green & Son, archts.: 154
Tomb of the Unknown Soldier and Approaches, Arlington, Va.: Lorimer Rich, archt.: Thomas Hudson Jones, sculptor: 255
Tower of Learning, University of Pittsburgh; Charles Z. Klauder, archt.: 12

United States Customs House and Appraisers Stores Bldg., proposed, Philadelphia; Ritter & Shay, archts.: 154
United States Legation and Consular Bldg., proposed, Ottawa, Canada; Cass Gilbert, archt.: 155
Upjohn, Hobart B., archt.: All Souls Unitarian Church, New York City: 13
Utretch Catherdral, 1929, from the pencil drawing by Gerald K. Geerlings: May *Frontis.*

Valley Hospital, Sewickley, Pa.; Schmidt, Garden & Erikson, archts.; S. S. Goldwater, M. D., consultant: 74
Van Pelt. Jr., Garrett, archt.: House of LeRoy Kellogg, Pasadena: 21
Van Tassel Apts., North Tarrytown, N. Y.; Andrew J. Thomas, archt.: Jan. *Frontis.*
Verandas, A Portfolio of: 231

Waid, D. Everett, and Harvey Wiley Corbett, archts.: Metropolitan Life Insurance Co.'s Home Office Bldg., New York City: 12, 276
Walker & Weeks, archts.: Indiana World War Memorial, Indianapolis, Ind.: 13
Wash Sheds on the River Eure, Chartres, from the pencil drawing by Carl Loven: Feb. *Frontis.*
Washington Hospital, Washington, Pa.; Schmidt, Garden & Erikson, archts.: 89
Way Out, The, by Marshal Leslie Oliver: 247
Windrim, John T., archt.: Benjamin Franklin Memorial and Franklin Institute Museum, Philadelphia: 276
Worcester Art Museum, Worcester, Mass.; William T. Aldrich, archt.: 155
Working Drawings, by Jack G. Stewart: XXXII. Casement and D. H. Window in Frame Wall: 41. XXXIII. Various Swimming Pool Sections: 104. XXXIV. Various Skylight Construction Details: 162. XXXV. Various Residential Eave Details: 215. XXXVI. Various Residential Watertables: 290. XXXVII. Detail of Bar Construction: 342
Wright, Henry: The Sad Story of American Housing: 123. Are We Ready for an American Housing Advance?: 309
Wright, Henry and Clarence S. Stein, consulting archts.; Ingham & Boyd, archts.: Chatham Village, Pittsburgh: 12

Yale Divinity School, New Haven, Conn.; Delano & Aldrich, archts.: 269
Y. W. C. A. Bldg., Chinese, San Francisco; Julia Morgan, archt.: 195

Zantzinger, Borie & Medary, archts. in conjunction with The D'Ascenzo Studios, craftsmen: Stained Glass for Night and Day, St. Paul's Church, Chestnut Hill, Pa.: 164



*George H. Van Anda*

VAN TASSEL APARTMENTS, NORTH TARRYTOWN, N. Y.
ANDREW J. THOMAS, ARCHITECT

ARCHITECTURE

VOLUME LXVII JANUARY 1933 NUMBER 1



Wurts Brothers

*An archway entrance to the inner court of the Amalgamated Housing Corporation project, the Bronx, N. Y. Springsteen & Goldhammer, architects*

# A Designer's Notes on Low-cost Multi-family Housing

## *By Thomas C. Stapleton*

IT is only within recent years that large-scale housing has received the attention of prominent architects, who have since become specialists in this field. As the fundamental purpose of this type of work is to bring to the mass of people living conditions of a higher order, encompassing greater social and recreational advantages at the lowest possible cost, the problem of design has become increasingly more important. Tenants are no longer satisfied with just a place to live, but have come to appreciate, respect, and in many cases demand, carefully planned and well-designed houses.

With the increasing demands to reduce rental cost per room, and at the same time accomplish the aforesaid results, there are few problems in the architectural profession which present such limitations to the designer as multi-family housing operations. Fortunately, economy of space and materials has in many cases forced the hand of the designer to a result of simplicity.

During the experience of my participation as



*Wurts Brothers*

*Phipps Garden Apartments, Sunnyside, Long Island. Clarence S. Stein, architect*

designer and co-designer of some of the largest housing developments in this country, certain fundamentals were discovered. These were used as a working basis. The preservation at all times of domestic character was strictly adhered to, and it has been quite apparent that without this "domestic feeling" the building, or group of buildings, could easily acquire an institutional or factory-like appearance.

As the low-cost projects prohibit the use of customary cornices, sloping roofs, and many other details familiar to the layman and associated with domestic architecture, it has been found necessary to concentrate upon mass, proportion, and fenestration.

With the development of planning, the area occupied by the buildings has become smaller, and the feature of gardens was introduced. I believe that this feature will become one of the designer's greatest assets. It provides a great deal of domestic atmosphere and is a practical source of enjoyment to the tenants. The heretofore more desirable street apartments are losing their popularity to the apartments which face the garden.

In the large-size developments it has been found fitting to incorporate a children's playground with all its accessories. These playgrounds, generally speaking, are not particularly attractive to look at, and should be well screened where possible with adequate planting. Usually adjoining the playground, in the building, it is quite necessary to have a well-equipped nursery. At a very small added expense, this nursery may be attractively painted with juvenile decorations.

The auditorium has been found a valuable asset for the purpose of entertainments, weddings, and other social gatherings. A maple floor, sand-finished walls and ceilings, painted and glazed, specially designed lighting fixtures, a stage or platform, a supply of collapsible seats, a small kitchen, fully equipped, and a cloak room with lavatory adjoining, comprise the necessary arrangements.

In studying the wall surfaces, the single window devoid of mullions, with well-designed proportions, is found most fitting. The concentration of ornament to points that are easily observed, such as around doorways in the form of stone carving, brick design, or perhaps decorative metal work; or to points of accent in the upper portion of the building, is both economical and in good taste, and I have learned that the employment of the very best craftsmen available has been entirely justified for this work. In my opinion, a well-designed, beautifully executed lantern, or a fine piece of stone carving by a master craftsman, in the correct location, has the tendency to add quality and richness to the simplest of surrounding building materials.

As it is most economical to use brick in the construction of this type of work, I have spent much time in experimenting with both the color and the texture of this material. In our closely populated cities, where dust and smoke have to be taken into consideration, the brick that will withstand these ravages and still maintain its appearance should be chosen.

On some of the largest housing developments, brick was imported from Europe. This brick had both the desired texture and color, and a great deal of domestic character. However, the imported brick presented many difficulties. One might choose a very satisfactory sample, but, owing to the fact that the European brick factories are generally owned by individuals and run on a small scale, the brick is collected and delivered to a central shipping point.

Each manufacturer having a slight variation in his product, this of course becomes obvious when the brick is laid in a large building operation, and the approved sample is found to be misleading.

These conditions prompted me to comb the American market for a brick that would have the texture and color of the foreign brick. It was also necessary to be assured of uniformity. After spending considerable time and receiving splendid co-operation, brick was developed which seemed to meet all the requirements. During the process of manufacture, the face and edges were made irregular. The brick contained colors of golden browns, oranges, yellows, and a delicate rose. These colors in a solid wall form a perfect complementary to the natural greens of the garden shrubbery.

An effective method of bricklaying is to use a course of headers and a course of stretchers, alternating the joints of the stretchers (see photograph on page 5.) This produces a diamond pattern with the brick joints and has been used almost exclusively by the writer. The mortar joint is approximately ½" thick, depending upon the size of the brick, as the dimension of 2¾" for one brick and one joint works out well for structural purposes. If a brick 2" can be procured, leaving a ¾" joint, this condition would be preferable.

It is a good idea to color the mortar, either by the use of coarse yellow sand or dry pigment with the cement.

The arcade, which has been successfully incorporated in so many of the modern housing developments, provides an interesting place in which to use this same brick. Whether the ceiling be flat-arched with concrete beams, or vaulted with stucco, the effect of the brickwork has a tendency to tie the whole together. In many instances stone trim has been eliminated from the minor doorways and a satisfactory effect gained by the use of brick design with either rough-edged slate or tile laid with the edges showing.

Departure from the flat roof is not advisable, as the introduction of pitched roofs of any kind increases the cost without any material benefit; in cases where roof effects have been added, they will be found artificial and not in the cause of good design. Low-pitched roof effects are never advisable, owing to the excessive cost of construction and the difficulty of making them weather-tight. However, such effects as may be gained by the use of pitched roofs on stair and elevator bulkheads and penthouse enclosures are quite favorable.

It is especially recommended to apply individual designs to the large boiler flues and other chimneys.

At present the most economical and practical window for use in low-cost multi-family housing is the double-hung wood window with wood frame. From the design point of view, in some cases it would be desirable to use the steel casement window, but at the present time, the manufacturers have not been able to produce a window in competition with the wood double-hung window that is practical; the low-priced steel sash is of very light construction and, with the demands made upon it by multi-family housing use, it cannot be maintained weather-proof. There is also the difficulty of getting good installation with this low-priced sash, as it is found after the work has been completed that many frames have been twisted and are almost impossible to straighten. When these difficulties can be overcome, there is no doubt about the advisability of using the casement



*Wurts Brothers*

*The studied handling of fire escapes, Phipps Garden Apartments, Sunnyside, Long Island. Clarence S. Stein, architect*

sash, and to be practical it should have ventilation by transom at either the top or bottom.

It is not advisable to use a double-hung window in excess of 4′ 6″ wide. Double-thick American glass is recommended at all times. Careful study should be made of the proportion of the individual lights of glass in relation to the window opening. This proportion should be maintained throughout the entire operation regardless of the size of windows.

Owing to the simplicity in the general design of the multi-family housing, brick window-sills are more harmonious with the general character of the building than stone or terra-cotta sills, and if properly laid, with ¾″ pitch and ½″ overhang, are just as practical.

Careful study should be made of the exterior painting of window frames and sash. The general tone of the building surface should be carried into the windows, to avoid the effect of burned-out holes when viewed from a distance. A harmony color, two or three shades lighter than the brick, will accomplish this result.

As it is necessary to add a coping to the brick walls of these flat-roofed buildings, ordinary rough-edged roofing slate supplies a free line of drawing at the top of the building which is not obtainable with the customary use of stone or terra-cotta coping. This slate should be in thicknesses of ¾″, the width to conform with the brick wall, allowing for a slight overhang front and back, length approximately 20″ to 36″, laid in a bed of ½″ mortar, with slightly raked-out joint. For the complete thickness of this coping for from one to three stories of building height, it is advisable to use three thicknesses of slate and three beds of mortar, with a total dimension of approximately 4″. On buildings above three stories in height, an additional layer of slate and mortar may well be added, giving an approximate thickness of 5″.



George H. Van Anda

*The decorative possibilities in chimneys, Van Tassel Apartments, North Tarrytown, N. Y. Andrew J. Thomas, architect*

Where it is found necessary to have fire-escapes, and the cost of special designs is prohibitive, the rule of painting them the same color as the brickwork will tone them down considerably.

The use of directory boards is necessary to the housing development using the street arcade and garden entrances. This directory board lists the tenants in the various buildings, and usually designates the building in which each apartment is located; it is very conspicuous and should have the special attention of the designer.

One of the most satisfactory types of numerals or lettering to be used as a designation of the entrances is a bronze concave letter, filled with a cream-colored porcelain. This letter is easily visible at all times and requires no care.

The name and push-button plates made of half-polished wrought iron, in large quantities cost but little more than the customary brightly polished brass, and contribute to the general effect.

Where the use of garden walls is needed to join buildings in one development, the same type of brickwork as that of the building is employed, with a simple coping of either tile or slate. A sturdy, well-designed oak gate is much more attractive than the usual iron one.

Inside the building, two very practical materials for the stair-hall side walls are the so-called "tapestry brick," and stucco effect, either one resisting the children's pencils. The stair-hall floor and base of oiled bluestone, variegated slate, or harmonious quarry tile, is attractive and easily cared for.

Owing to the economy in space of entrance

vestibules and stair-halls in this type of planning, it has been found advisable to eliminate lighting fixtures that hang from the ceiling. A simple close-to-the-ceiling fixture has a better appearance and is much more practical.

A more desirable effect is gained by painting the iron soffits, strings, and balusters of the stairs a cheerful color, harmonious with the walls, rather than the conventional dark green or gray. The handrail and newelpost caps, for practical reasons can be painted the same color in a rich dark tone. For the stair treads, inch-thick slate is good.

As to heating, cast-iron radiation at the present time continues to be less expensive than other forms. Fireplaces are entirely out of the question in low-cost multi-family housing.

Kalamein doors of the apartment entrances, painted one or two shades lighter than the side walls, seem to dispel the gloom of a dark door or the artificiality of a grained one.

Single-panel gumwood doors, painted one or two shades darker than the wall color (trim to match), are preferable to staining, as the natural color of the wood is not uniform and a very dark stain is necessary to tie the whole together. With the general preference for light-colored walls, the dark stained door has a tendency to create the effect of voids in the wall surface.

A saving may be made by omitting the trim around windows, but not around the doors. The width of trim depends upon the size and scale of the rooms in the development—3″ is a good standard in this type of work.

For interior painting, a good three-coat job of the usual specification is provided, with flat paint on all rooms with the exception of the kitchen and bathroom, which receive a flat enamel. Long experience has shown that there is absolutely no economy in cheap paint. The writer has had the experience of selecting interesting colors for the various rooms only to find after a period of about three weeks that the colors had changed completely. This has been directly traced to the quality of paint. The general procedure in selecting colors for an apartment depends primarily upon its location, and the quality of light which it receives. An apartment which faces the north should receive a generous amount of the warm and lighter colors. The grays and grayed colors should be avoided. As most apartments in the new type of multi-family garden plan receive more than one kind of light, or one portion of the apartment faces north and the other east, west, or south, the rooms on the south side can, with a great deal of certainty, be painted in attractive grays, greens, and even a carefully selected blue. Taking the rooms individually, entrance halls or foyers are best painted the same color as the living-room, which should generally be a warm color, such as a very light sienna, umber, orange, or rose orange.

These colors, of course, are all slightly grayed with their complementaries, so as to form neutral backgrounds for furniture and hangings. Where the apartment contains more than one bedroom, a warm French gray in one room and a light rose apricot in the other room give a good choice. Where the apartment contains only one bedroom, I would suggest a warm grayed ochre color. The bathrooms may be tinted slightly off the white, with an attractive green, more blue than yellow, or a slightly grayed blue. The kitchens, dinettes, servettes, etc., should be kept a bright pastel yellow, not far removed from white. All ceilings should be tinted calsomine (excepting the enamelled bathrooms and kitchens), to match the side walls, but a few shades lighter.



George H. Van Anda

*Entrance detail of the Van Tassel Apartments. Making the most of simple materials*

In conclusion, on the subject of painting, the writer has found that by going to the job and selecting a well-located apartment and setting up a simple palette, the colors are then mixed upon a large sheet of glass and tried on the light and dark walls of the room, which have previously been primed. These samples, when found to be satisfactory, may be sent to the paint manufacturer and duplicated in the quantities desired. This will insure a uniform result which is not obtainable by the hit-or-miss mixing method.

Side walls and ceilings of all rooms are best finished in hard plaster. This will allow for a good painting job, and is the basis for any desired effect. Panelling with panel strips not only has a tendency to make the room look smaller, but cuts the walls up into impossible divisions for the placement of furniture and decorations, and should be discouraged.

Picture moulding is generally desirable throughout the apartment with the exception of the kitchen and bathroom. Where the ceiling height is uniform and there are no structural beams exposed, it is most desirable to place the moulding close up to the ceiling and include it in the color of the room.



*Wurts Brothers*

*Details of the Phipps Garden Apartments. Making the most of brickwork*

The general effect in the kitchen should be one of brightness and cheerfulness. A neutral linoleum floor, either in tessellated pattern or solid color, is practical. Solid panelling in the cupboards is recommended. The equipment should include a gas range of standard make, iceless refrigeration, one wash tub and sink combination at least 3′ high, and a hanging clothes-dryer. Provide an adequate amount of electric outlets.

In the smaller apartments, a kitchenette replaces the kitchen. This kitchenette usually consists of a sink, range, icebox, shelves, and cupboards, all compactly placed in an area of a minimum size of 3′ by 10′.

The allowance made in the budget for lighting fixtures of apartments usually means stock design. With the quantity required, it will be found entirely practical for the designer to create his own designs, and in many instances effect a saving over the cost of stock fixtures.

As to flooring, for living-rooms and bedrooms, there is a choice of many types and kinds, such as cement, rubber, cork, wood composition, etc., but experience up to the present has shown that a good grade of oak strip flooring is the most desirable from the tenants' point of view. This flooring should be given a dark stain, to tie the various natural colored strips together, and properly waxed.

For kitchens, where the budget will allow, a yellow pine strip floor, covered with a well-chosen linoleum, will prove satisfactory.

For bathrooms, a black-and-white tile floor in small basket-weave design provides a good appearance. The use of colored side-wall tile is not advisable, owing to the variation of taste of the tenants, and a good commercial grade, slightly off the white, will be more generally acceptable. The height of the side-wall tile should be approximately 4′ 6″ above the floor, with extra height around the tub.

Among the factors that will cause significant changes in future design are the revision of building laws, application of new materials, and the certainty of automatic elevators displacing the walk-up apartments.

Many of the recent projects show a tendency toward modern architecture. If the charm of domestic architecture can be successfully combined with modern design, the housing development of the future will, in all probability, become a distinctive type of architecture.

# The Ratio-Envelope of Form

## *By Rutherford Boyd*

*In the December number Mr. Boyd launched us into a new field of thought, dealing with certain proportional relationships of volume. We were given merely a bird's-eye view of these three-dimensional relationships. There is much to be revealed upon closer inspection, the main elements of which are here set forth.*—EDITOR.

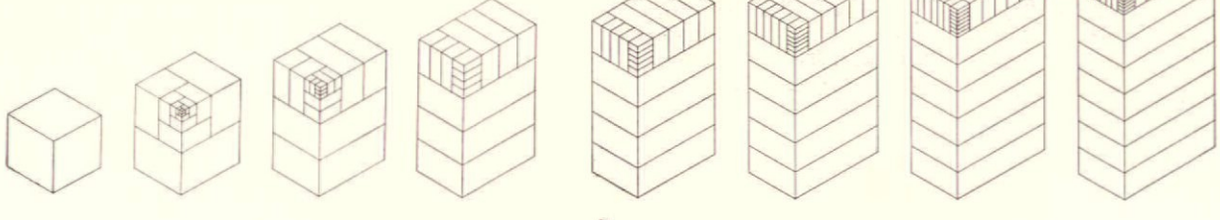
Copyright, 1932, by Rutherford Boyd.

AFTER all our investigations in design, even to this day there remains a great mystery—the extraordinary fact that all known systems of design are based on two-dimensional ideas. The most important of these are series of continued proportions expressed in a linear method, or in proportionate areas on a plane, or in a group of planes such as the exterior and interior surfaces of any edifice.

Yet since the day when the Greeks expanded their ideas of proportion beyond the mere relations of integers, we have had common knowledge of a method of developing a consistent form-organization in three dimensions; in other words, a series of terms in a continued proportion. So, recently, the series of "ratio-volumes" have been invented. These are rectangular volumes in which the height is to the width as the width is to the thickness.

The simplest group of the ratio-volumes are those shown in the eight phases of our diagram, each drawn with the smallest or unit dimension to the left and on the same scale. Beginning with the cube as the limit (whose dimensions are in the ratio 1 to 1 to 1), we develop next the "ratio-volume of bisection." If we bisect the greatest dimension of this form we produce two rectangular volumes each one-half of the original volume, each equal to the cube in mass and each similar in shape to the whole. We must emphasize this unique property: each "ratio-volume" in this group has its own spatial anatomy and no other shape has similar characteristics.

*Beginning with the cube, the elemental series of ratio-volumes, all drawn in similar position and to the same scale, with the unit length to the left in each case. The cube is followed by the bisection and trisection volumes, etc., which are explained in the text*

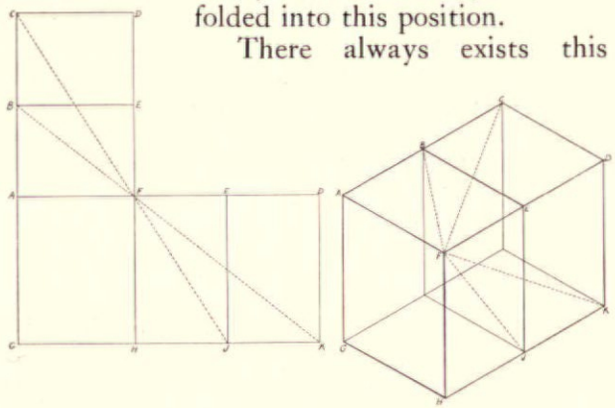


So we proceed with the group: the trisection ratio-volume equals three cubes in mass and one-third of the original volume has precisely the same shape. The fourth ratio-volume equals four cubes in mass, and one-fourth is similar in shape to the whole ratio-volume. And so on to the fifth, sixth, seventh, and eighth ratio-volumes. The eighth is noteworthy and its dimensions are always in the proportion of one to two to four, consequently the mass is equivalent to eight of the cubic units and one-eighth of the volume equals the unit cube in mass and is exactly similar in shape to the original volume. So begins this special series of rectangular ratio-volumes, each increasingly "taller and thinner" as the dimensional ratio increases.

It is simple to remember the ratios in this series, as they are the cube roots of the integer of their division-scheme; that is, the ratio of the bisection volume is the cube root of 2, etc. This process of division can be continued indefinitely, or the ratio-volumes can be expanded in the same way. We have shown here in each one four successive volume divisions. Of course, every volume in each group is similar to the containing envelope of form, its ratio-volume.

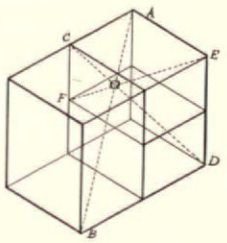
Implicated in this tridimensional form-idea is a simple and important surface development which we will illustrate in the bisected volume. We bisect ratio-volume *A C D K H G*, consequently the half-volume *A B E J H G* is similar in shape to the whole. If we unfold the three surfaces on a plane, it then becomes evident that the end of the rectangle *A F G H* is the same in each case but the largest surface *F D K H* and the intermediate area *A C D F* are the same in length (*F D*) but different in

shape. We realize these two sides must be such a shape that the half of the largest side *F E J H* is similar in shape to the intermediate side, and the half of the intermediate rectangle *A B E F* is similar in shape to the largest face. This is graphically shown by their continuous diagonals, the dotted lines, when unfolded into this position.

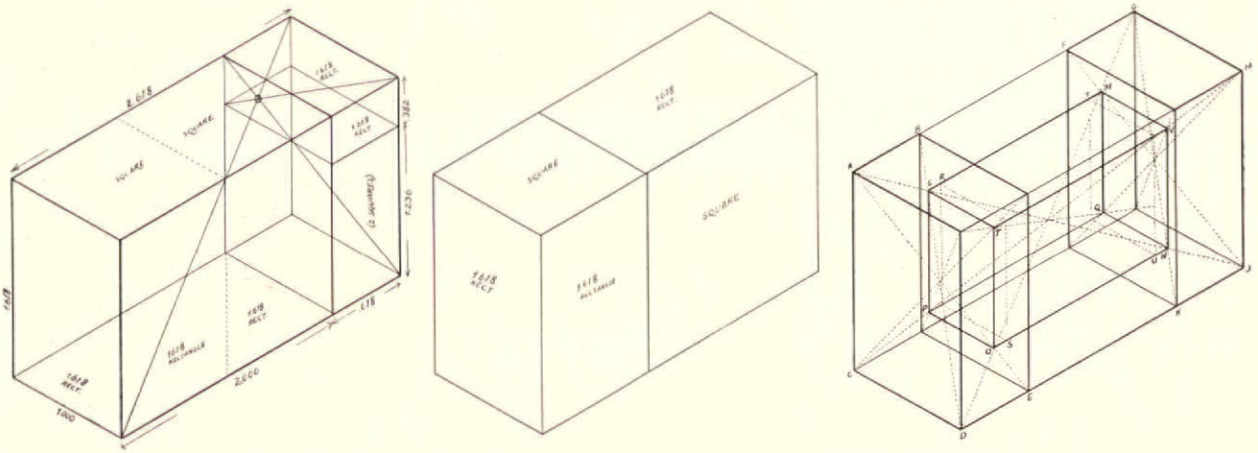


There always exists this unique kind of relation between the areas that form any of the rectangular ratio-volumes. Thus in any trisection volume one-third of the largest face is similar in shape to the intermediate face and the largest face is similar in shape to one-third of the intermediate surface.

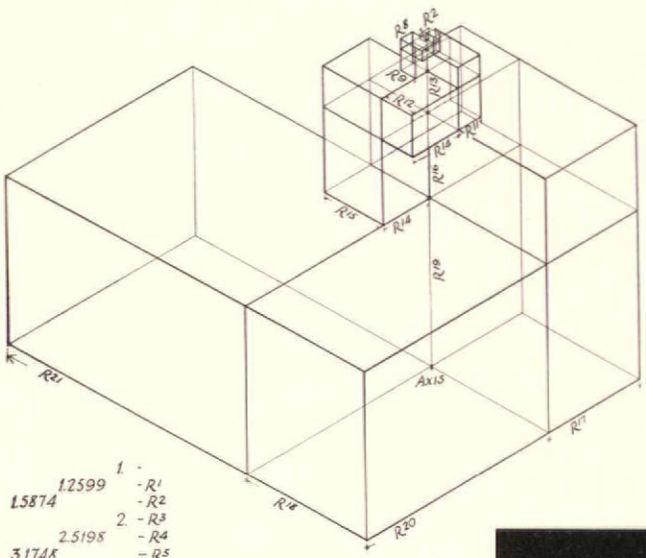
The most important points of the interior geometric structure of ratio-volumes are called the focal points. These are the eight intersections of the main diagonals and those of the subdivisions taken in order. In this bisection volume, *A B* is a main diagonal intersected by the diagonal *C D* of the half-volume and also by the diagonal *E F* of the quarter volume, the next smaller in the series, the point of intersection *O* being one of eight similarly situated focal points.



Always in any series of ratio-volumes, the largest surface of one equals the smallest face of the next larger volume in the series. This fact leads us naturally to the phenomenal development of a series of these volumes around a central axis. We illustrate this organization with the successive members of the "bisection series." This is the only possible arrangement of these volumes with the largest face of one volume coinciding precisely with the smallest face of the next larger volume. The diagram indicates that three volumes are situated around the central axis in each phase. Always the longest edge or dimension of the smallest volume becomes the intermediate dimension of the next volume and then is the smallest dimension of the largest volume. The form-organization then "steps" down to revolve around a new section of the central axis, which in this series is always twice the length of the axial section above it.

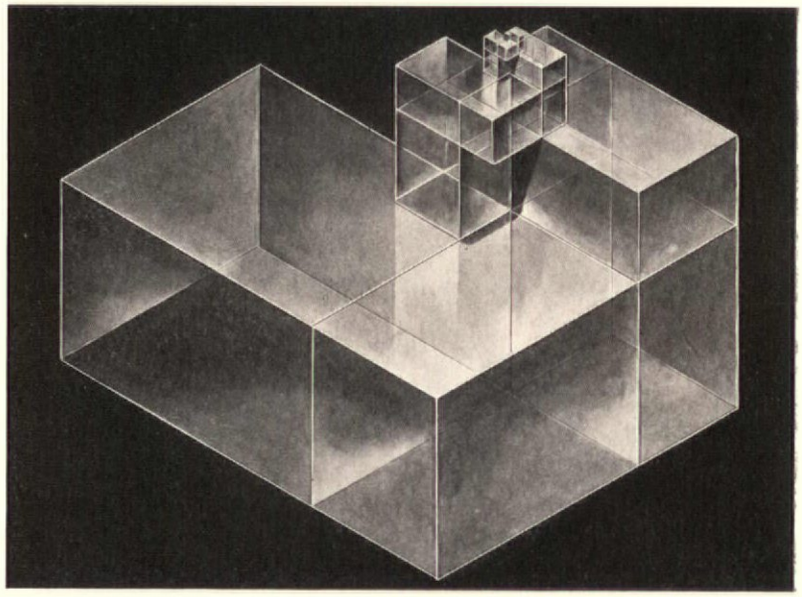


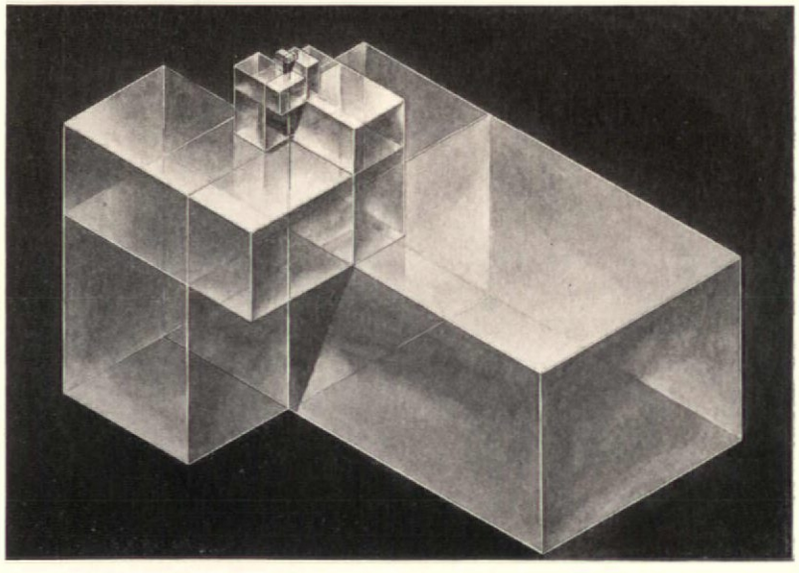
*Three developments of the 1.618 ratio-volume whose dimensions, indicated in the first figure, are 1 to 1.618 to 2.618. The point O at the intersection of three diagonals is one of the eight focal-points. The surface is divided, as marked, into squares and 1.618 rectangles. The central form shows a simple area-plan of squares and on each face a 1.618 rectangle, all alike in size. The third figure shows the reciprocal forms, A B E D C and F G H J K, which are the next smaller phase in every ratio-volume. The "focal-volume" L M V N Q P O T has its corners in the eight focal-points. This focal-volume is identical with the reciprocal volumes which are penetrated by it at each end to the rectangular sections R S and T U*



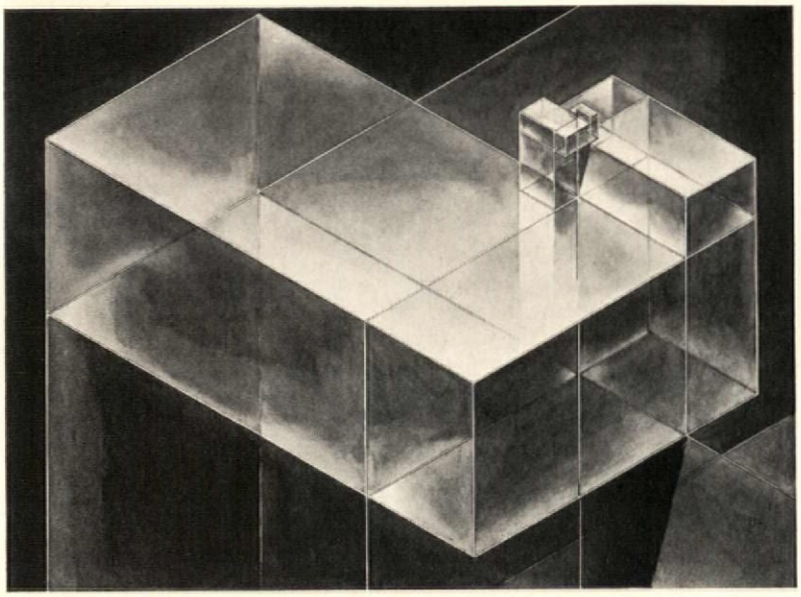

1.
1.2599 - $R^1$
1.5874 - $R^2$
2. - $R^3$
2.5198 - $R^4$
3.1748 - $R^5$
4. - $R^6$
5.0396 - $R^7$
6.3496 - $R^8$
8. - $R^9$
10.0792 - $R^{10}$
12.6992 - $R^{11}$
16. - $R^{12}$
20.1584 - $R^{13}$
25.3984 - $R^{14}$
32. - $R^{15}$
40.3168 - $R^{16}$
50.7968 - $R^{17}$
64. - $R^{18}$
80.6336 - $R^{19}$
101.5936 - $R^{20}$
128. - $R^{21}$

*The phenomenal development of any ratio-volume series about a central axis, here exhibited in the bisection series. The successive forms are so arranged that the largest surface of each volume coincides precisely with the smallest surface of the next larger volume in the series. Each section of the axis is thus formed by three coinciding edges of three successive ratio-volumes. The dimensions are marked as powers of the ratio R and the actual linear lengths are shown in the table with the dimensions to four decimal places. These are the powers of the cube-root of two, so that every third power doubles the previous length. This is true, of course, beginning with any length in this series of ratios, which doubles the length in three terms of the series*





*Two isometric views of the bisection series of ratio-volumes. Each vertical section of the axis is formed by three coinciding edges of three successive ratio-volumes. Each volume is similar in shape but twice the mass of the preceding volume. Note the "clockwise turning" in the grouping and as only three forms "fit" around any axial section there is always a fourth rectangular space which is vacant. In the lower illustration the same bisection series group is shown from the exactly opposite point of view. Note again the rectangular vacancy which occurs on each section of the axis, first on one side of the axis then on the opposite side. The volumes pass through six different positions in relation to the axis and then repeat the cycle of position*

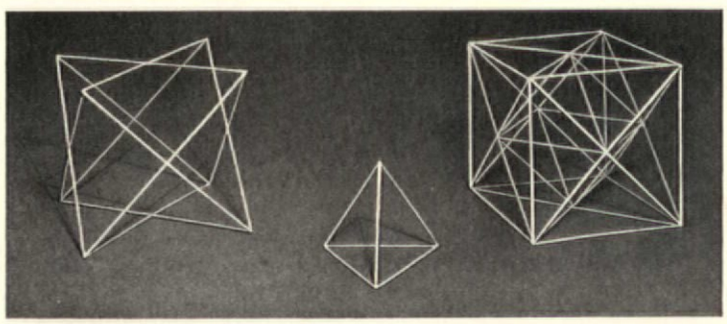


*An isometric view of the axial development of the trisection-series of ratio-volumes. Each successive volume is three times larger in mass but similar in shape. This grouping continues to increase indefinitely as suggested, following exactly the same cycle of six positions in axial rotation, in the bisection-series drawings. This method of rectangular generation is a unique property of all series of ratio-envelopes*

This grouping, with its helical aspect, has some analogies with the cellular increase in spiral shells and other natural forms, but has no real counterpart in nature. In the nautilus shell, for instance, each division is similar in shape and also in position in relation to the nucleus or origin. But these ratio-volumes must of necessity assume three different positions in relation to the axis, one on its end, the next resting on the intermediate face and the next on its largest face; then the cycle of these positions is repeated.

The famous ratio of the "golden section," the so-called 1.618 ratio, generates a rectangular ratio-volume which has been discussed elsewhere, but is of even greater interest in conjunction with the series of other ratio-volumes. It has the unique property, among others, that each volume equals the "focal-volume" of the next larger form in the series. Needless to say, we can postulate other ratio-volumes with unusual spatial properties of their own. But these serve to indicate the elements of a rectangular concept in basic design.

Out of this idea may be developed varied form-organizations in any media which should have an innate force and power that is inherent in their spatial properties. However, we must be content at present simply to introduce this new conception in tridimensional form; it may help toward unifying those two phases of human endeavor which, perhaps for want of a better understanding, we arbitrarily separate into Art and Science.



*The cube, or limiting case in ratio-volumes, with a development in diagonals similar to the interior structure of ratio-volumes. In the cube all the eight focal-points, present in all other volumes in this series, have moved into the centre of the cube due to the cubical dimension ratio of 1 to 1 to 1. The model on the left is formed by the twelve diagonals of the six squares on the cube and forms two interlocked regular tetrahedrons. One of these is shown in the central figure, composed of four equilateral triangles*

# Floating a Sketch

*By Fred R. Lorenz*

THUMBNAILS! Partis! Criticisms! After making reams of them, the designer had put his best into the final presentation, to go to the committee in a rush. And now for the mount. A lilting tune he whistles during the preparations—then comes the oath, and shivers up and down the room. The mount is a flop, for it *has been* flopped! In turning the dripping sketch over, he ripped the moisture-weakened corners, and paste dripped everywhere. Also there are wrinkles and ridges. Raising one corner, then the next, he tries to work the sketch flat, but cannot do! Is not that a dainty sketch to set before the jury?

As a result, I explained a simple trick I had learned, and the office boys handled the mounting after that with a good fielding average, the occasional errors being for the most part easy to redeem. I will pass it along, for I find a great many still "flop" the wet tracings over onto the mounting-board, *instead of vice versa*, which is less hazardous. The larger the tracing, the harder they "flop," under the former method.

Here is a description of the complete mounting process:

1. The following materials should be at hand:

*Level working surface*—a marble or glass slab, or a sheet of glossy oilcloth. Even a sheet of clean detail paper can be made to serve, in spite of the moisture-buckling. Do not tack the sheet down.

*Bowl of clean water and water sponge.*

*Bowl of cream-thick paste*—may be prepared with an egg-beater and strained through fine tea-strainer or cloth.

*Sponge for paste*—or use wad of cheesecloth, or a brush.

*Clean mounting-board*—moistened both sides to retard paste absorption and to offset buckling.

*6" or 12" scale*, or triangle, without sharp nicks and corners.

*A roll of common buff tracing paper*, width of mounting-board.

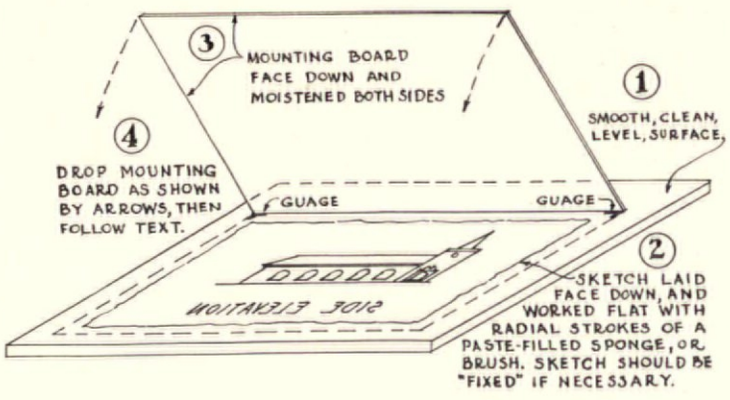
*A clean towel* for general purposes.

2. The sketch, previously "fixed," should be laid face down. Dip a sponge in the paste and spread it generously on the back of tracing, using strokes radiating from centre of sketch to edges, until sketch is thoroughly wet and flat, with edges in contact with working surface. Mop up with the sponge all pools of paste lying beyond the edges.

3. The mount-board, large enough to allow for trimming down later to desired size, should be placed in sloping position, shown by diagram, face down. Use no gauging marks on the mount or sketch, but on the working surface beyond the sketch, as shown.

4. Let the board down upon the tracing, the far edge resting on the working surface as a fulcrum. Give the back of board a few radial strokes with one hand, to establish adhesion with sketch, holding the other hand in centre to prevent slipping. The strokes should not be vigorous, but enough to establish a suction.

5. Lift board slowly at one corner, and if that corner of tracing is not lifting with the board, try the next corner. If none of the corners lift with the board, repeat the rubbing; or, with one finger under the corner of tracing, hold it against board and lift up, turning the incomplete mount right side up and mopping the working surface. If proper suction cannot be gotten, there is no doubt that more paste, or thicker paste, is needed. However, it is not wise to use a thick paste, but better to depend on good, generous distribution, saturating absorption by the board, and thorough elimination of air pockets, leaving an infinitesimal film of paste between sketch and board. A thick paste will stain sketch and board more easily, because lack of moisture promotes earlier drying and the paste moves more sluggishly under pres-




(*Continued on page 14*)



*A progress photograph of the Tower of Learning, University of Pittsburgh. Charles Z. Klauder, architect*



*The Edward L. Doheny, Jr. Memorial Library, recently completed for the University of Southern California, Los Angeles. Samuel E. Lunden, architect*

# Architectural News

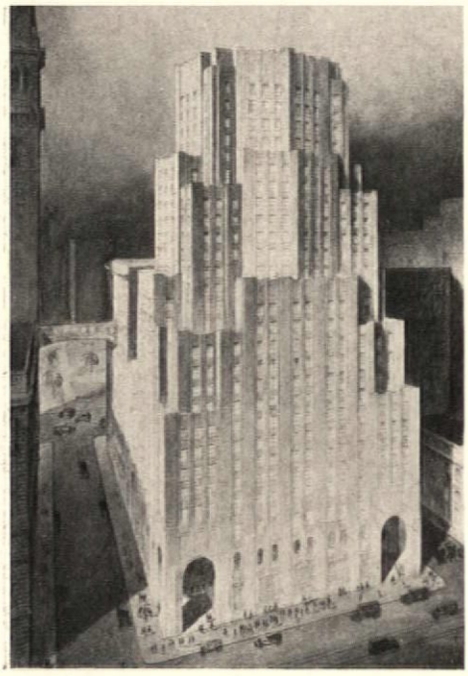


*Clark Memorial Hall, the new building for the Department of Law, University of Virginia. Walter D. Blair; Taylor & Fisher; Peebles & Ferguson, architects*



*Chatham Village, the new model housing project made possible by the Buhl Foundation, Pittsburgh. Ingham & Boyd, architects; Clarence S. Stein and Henry Wright, consulting architects*

*The new first unit in the Metropolitan Life Insurance Company's building project in New York City. This first unit is now completed. D. Everett Waid and Harvey Wiley Corbett, architects*





*The recently completed model laundry building, Long Island City, for the Knickerbocker Laundry Co. Irving M. Fenichel, architect*



*New City Hall for Newton, Mass., maintaining the classic tradition of New England. Allen & Collens, architects*

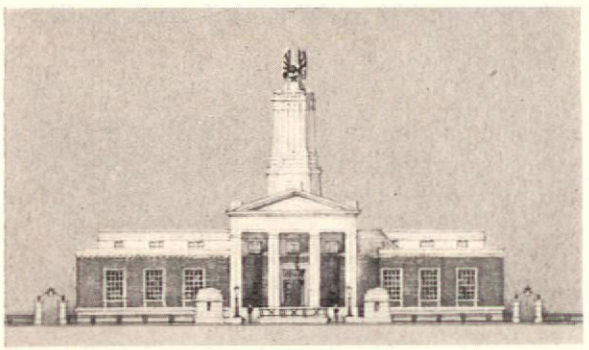
# in Photographs



*All Souls Unitarian Church at Lexington Avenue and 80th Street, New York City. Hobart B. Upjohn, architect*



*The proposed Infirmary Building of the Veterans' Home at Rocky Hill, Hartford, Conn. Douglas Orr, architect; Carl J. Malmfeldt, consulting architect*



*Front elevation of the Administration Building in Douglas Orr's scheme for the Veterans' Home, which design won an architectural competition*

*The main tower, from the north, dominating the Indiana World War Memorial at Indianapolis, Ind. Walker & Weeks, architects*




*The new fur salon in Hutzler Brothers store, Baltimore. Joseph Evans Sperry, architect*



(*Continued from page 11*)

sure of the "squeegee" strokes later. It might be well to again moisten the back of board before turning right side up, so as to balance the expansion taking place on the face since coming in contact with the wet tracing. A backer sheet of same paper as the sketch is sometimes advisable to counteract the buckling effect of the sketch. This may be applied immediately before the sketch, or later when the mounted sketch has dried under the press, and with slightly thicker paste.

To return to the operations: the pressure has squeezed out some of the paste, which, after each squeezing-out operation, should be wiped from the border with a clean wet sponge, especially if no mat or frame is to be applied over the board, so as to avoid discolorations. If paste gets on the face of the tracing, cautious patting and mopping with the sponge is necessary. This must be done thoroughly to prevent sticking to the squeeze-out papers now about to be used.

6. Now, tear off the roll a "squeeze-out" sheet of common buff tracing-paper, large enough to lap over the edges of the mount-board, and lay over same. With the scale or triangle (beware of nicks and sharp corners!) placed edge-down and inclined in the direction of the stroke, make radial strokes from centre to edge. Do not try to get all the paste squeezed out at once. Take it easy, one or twice around. I do not favor the use of the roller, as its effect is a pressure more downward than horizontal. Now lift the squeeze-out sheet cautiously at one corner. If the tracing lies well, remove squeeze-out sheet by pulling toward opposite corner. Chuck it in the basket to avoid getting paste on shoes and trousers while stepping around. Mop up excess paste around edges of mount and examine the sketch. It may not be flat, but if wrinkles and blisters show, they should be ironed out cautiously by the same process given above. An especially bad fold or wrinkle may require a partial lifting of the sketch and inserting a bit of paste for safety's sake. Repeat this operation of squeezing out paste several times with fresh sheets of paper, increasing pressure each time until tracing is absolutely flat. If the first and second squeezings are done carefully and not too vigorously, hardly a wrinkle will require nursing. It is important to use the *radial* stroke at all times to avoid this. Also, speed counts, so as to get the tracing flat and without wrinkles before the moisture from the paste is absorbed to the degree where the paste begins to take hold and set. Caution: beware of holes that may develop in the squeeze-out paper; take a fresh sheet—perhaps foreign particles are under the tracings.

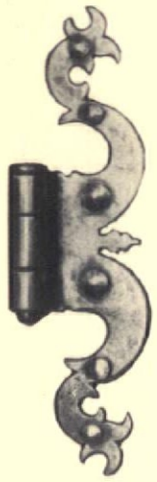
7. If satisfied that the mount is flat and dry enough, place in press, being sure that surface above and below sketch is smooth and level, and has no joints, such as between two books, or between two marble samples. I usually place mount on a drawing-board, protecting the mount above and below with a sheet of buff tracing-paper, and another drawing-board on top, and pile up a few heavy samples or books. The tracing-paper absorbs moisture, thereby hastening the drying, and should be replaced at five or ten minute intervals several times, then left for several hours, or overnight.

8. If a mat is to be used, do all trimming after the mat glue is dry, giving a strong thick edge. It is economical to have the mat made at a picture-framing establishment, where a clean workmanlike job will be done, with or without bevel. The order for a vertical mat would be: "Upright 14½" x 23" opening, top and side borders 3", bottom border 3½"." A horizontal opening is called a "landscape." The ply should be given as single ply, double ply; and the type, such as eggshell and plain; and whether the white or cream side is the face. Individual taste may require, of course, other types and colors of mats. For the mat, LePage's glue, thinned down with hot water, is excellent. Spread evenly with brush, avoiding excess glue at the edge next sketch. After placing mat, clip or clamp it to mount to prevent sliding; then roll vigorously. Remove glue showing at edges with wet cloth or sponge. Sometimes where glue gets on a rendered portion it is best to let it dry in the press and remove later with a knife and a wet cloth, then touch up the rendering.



# Today's Craftsmanship in Hand-wrought Hardware

*By Gerald K. Geerlings*



*To the left and right are two so-called double-dragon wrought-iron hinges, especially suitable for the narrow doorway*



*At the top and bottom of the page are contrasting strap hinges; both texture and design ably express the material—iron*

ONE of the obvious, though little considered, differences between pre-machine-age architecture and current architecture is that formerly hardware good or bad was out in plain view, while now, good or bad, it is practically out of sight. Aside from the commercial buildings where this is advantageous, on residential work it is a dubious gain. Until the machine ushered in its products, hardware played an important rôle in the decoration of interiors and was not to be overlooked on the exterior. It was sensible, this pride in hardware, for after all in opening or closing any door one is sure to be conscious of its handle and hinges if they are in view. The old Colonial doors, with their natural-finished iron hinges, made far more of an arresting pattern than our present formula of insignificant knobs and inconspicuous butts lost in a limitless sea of white.

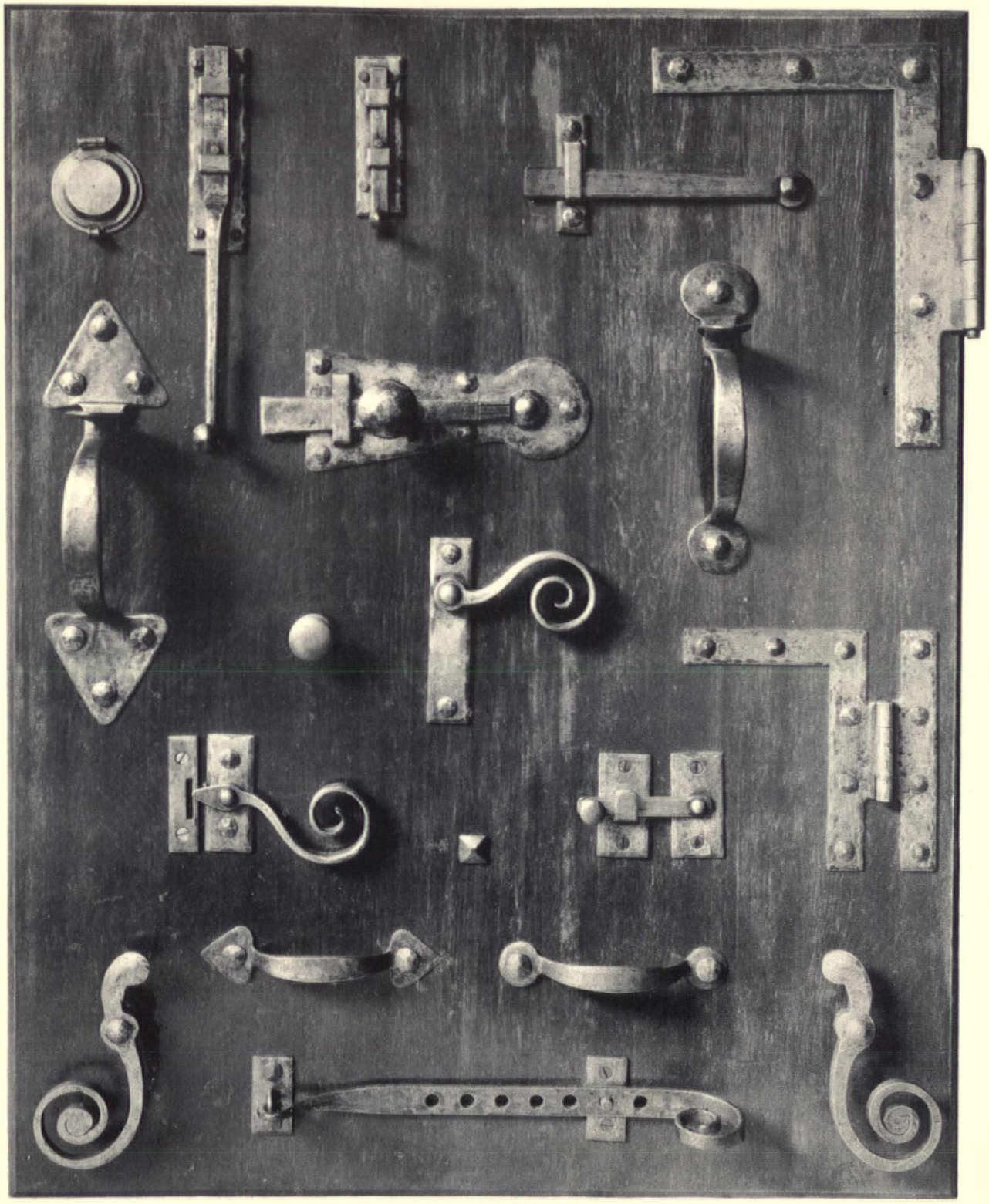
In the modern house the hardware is apt to be relegated to a last-gasp consideration, covered by a mere lump sum in the compilation of contract costs. If the hardware is not considered by the architect to be of any greater importance than just that, quite naturally it gets no more favorable attention when the job is completed. But let us assume that the architect from the outset realizes that the owners of a house live the greater part of the time in its interior, and derive their chief contemplative pleasures from the things about them. He may with perfect logic conclude that the money which it might cost to ornament the cornice, or to build the walls of stone instead of brick, or brick instead of siding, might be the better spent on the interior of the house. Here the architect's decorative work will certainly be as much in evidence as that of the interior decorator, the rug salesman, and the lighting-fixture artist.

All the accompanying illustrations are from work by The Iron-Craftsmen, a very impersonal name for very personal work by two partners, William Zimmerman and James Liberi. The former does all the designing and is a product of Pennsylvania, the latter, either personally or by direction, attends to the execution of all work, and originally came from Rome. For the last twelve years they have been functioning together in Philadelphia, previous to which time both craftsmen were with Samuel Yellin's organization for eleven years.

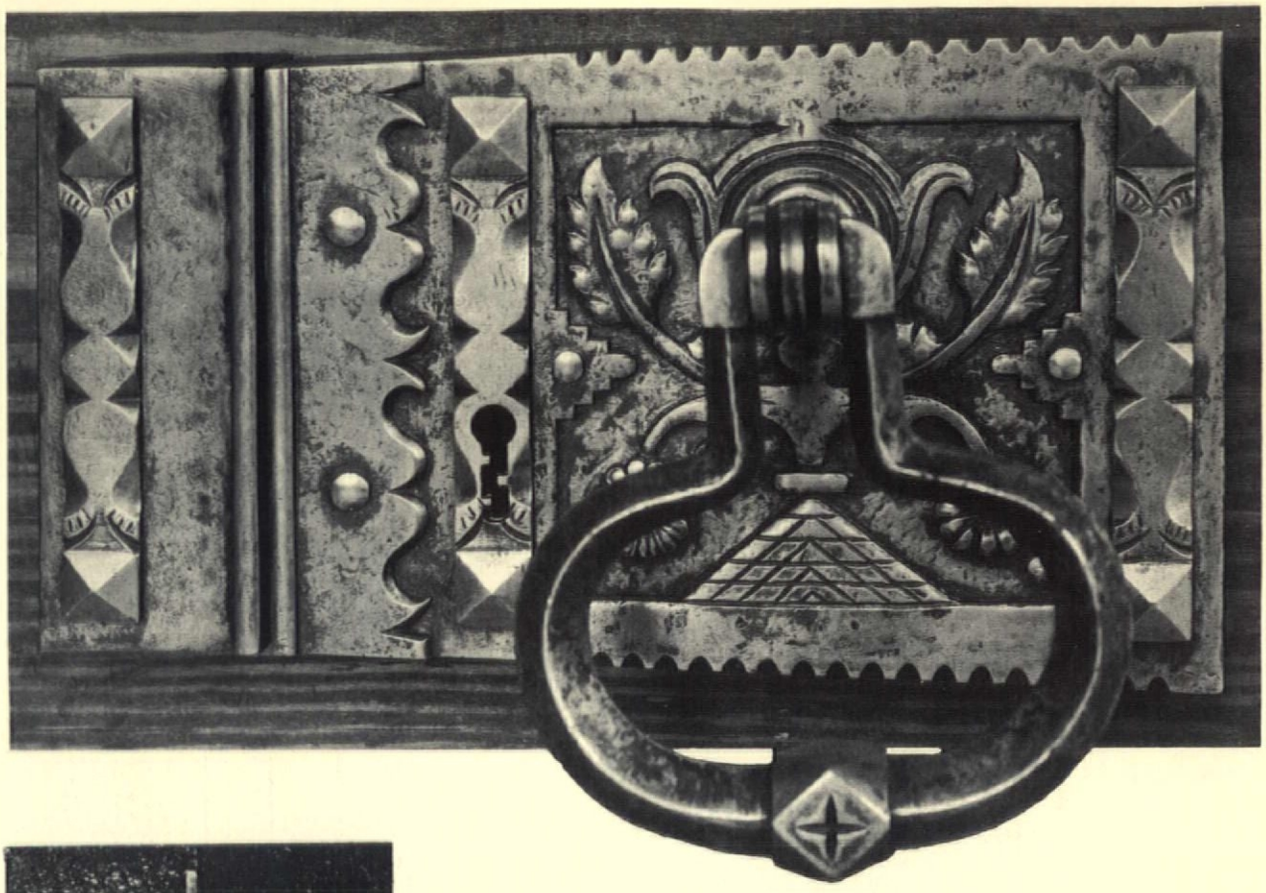




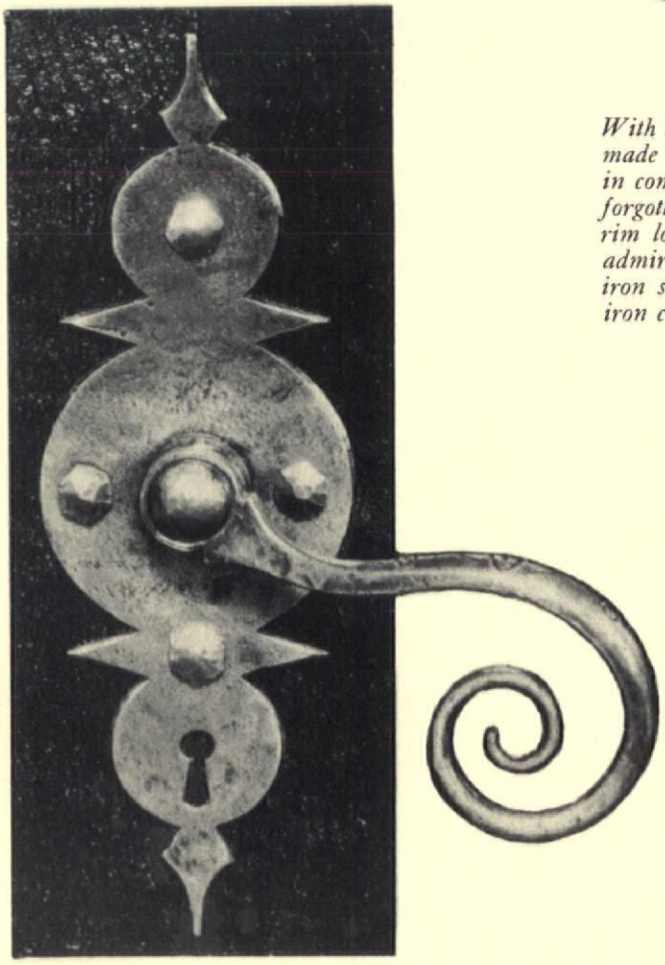
*For the house with Gothic tendencies, or the English periods following shortly thereafter, this assortment of wrought-iron handles and knockers gives a good idea of what can be accomplished in point of variety. All of these are from the residence of F. B. Paterson, at Dayton, Ohio (H. T. Lindeberg, architect). An idea of the scale may be derived from knowing that it is 24 inches from the extreme left to the extreme right. In each case the escutcheons have been made to conform with the stile widths*



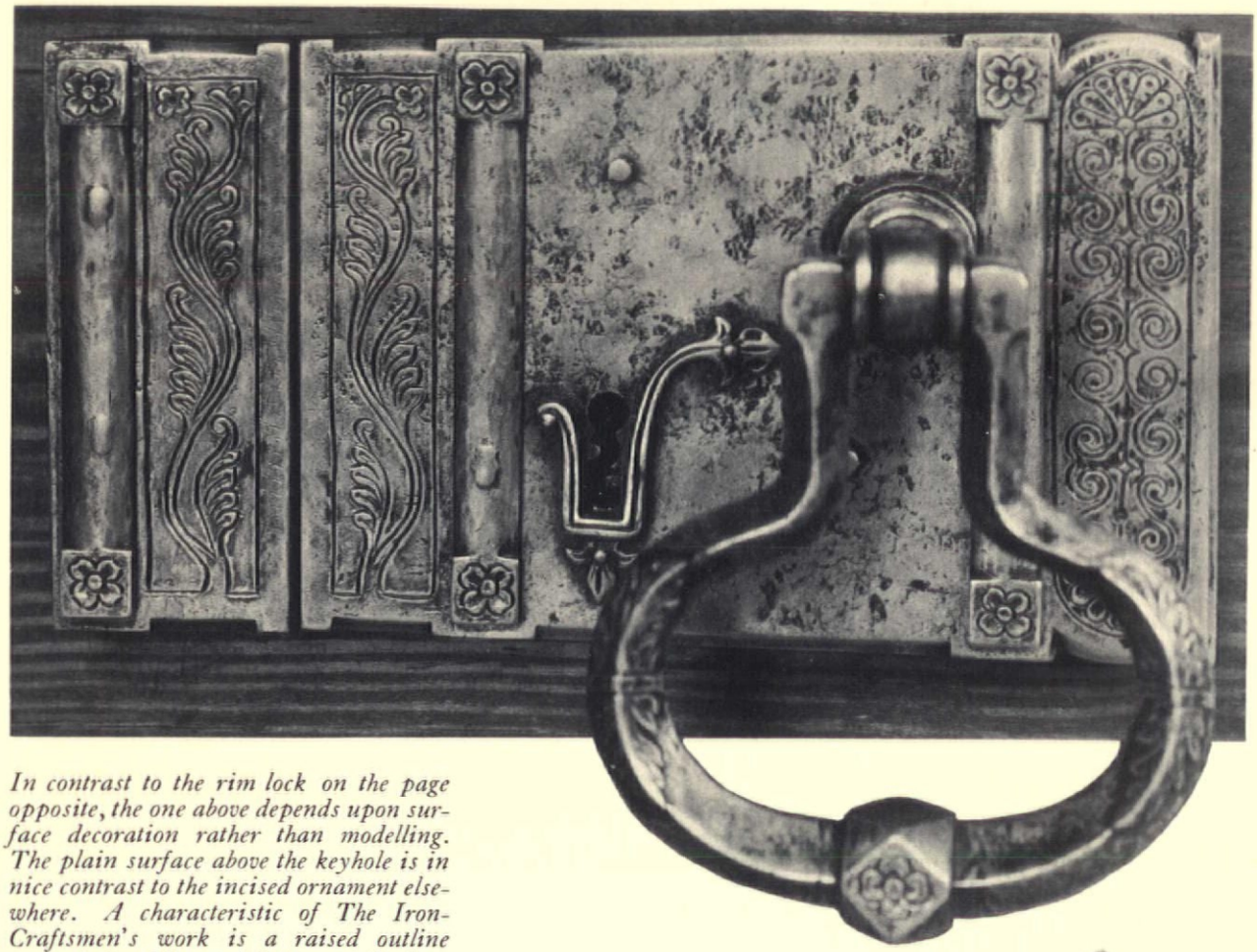
*For the typically American house with early Colonial antecedents, this type of wrought-iron hardware is one of the best means to make it of distinguished quality—the client's check book permitting. All the examples here illustrated are genuinely suited to iron, having been designed with the material in mind. Whatever their expense, it is safe to assume that, since they are both utilitarian and decorative, they are of more value to the house than though a similar sum had been spent on cornice modillions*



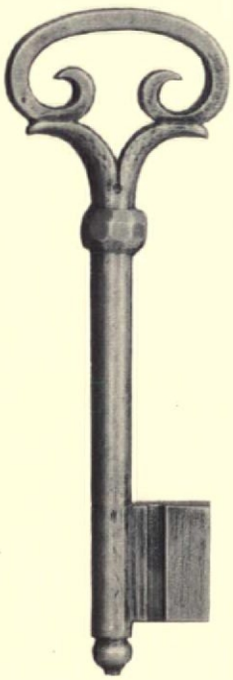
*With the general acceptance of machine-made locks and their advantageous usage in commercial buildings, we have almost forgotten the decorative possibilities of the rim lock in residential work. Such an admirable example as this in wrought iron serves to illustrate, too, how colorful iron can be, especially if it has contrasting planes*



*If a door to a room is used and not swung back out of sight, the handle or lock probably receives more attention than any other part of the room. Consequently if there is to be architectural decoration, the money cannot be more wisely spent than for hardware which is pleasurable both to use and to see. This design has Georgian tendencies*



*In contrast to the rim lock on the page opposite, the one above depends upon surface decoration rather than modelling. The plain surface above the keyhole is in nice contrast to the incised ornament elsewhere. A characteristic of The Iron-Craftsmen's work is a raised outline around the sides and bottom of the keyhole to act as a guide for the key*

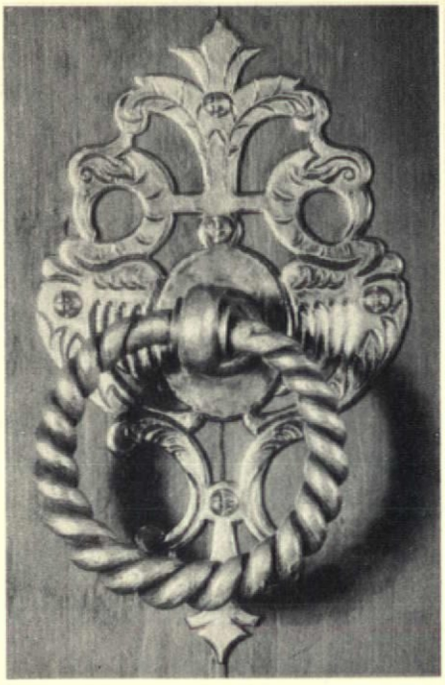




*For the panelled interior door which has narrow stiles, this escutcheon and handle are appropriate. It is one of a number on the residence of Owen Moon, Jr., at Winston-Salem, N. C. (Karcher & Smith, architects). Only ornamentation characteristic of wrought iron has been employed: variations in the surfacing, chisel marks, and twisted handle*

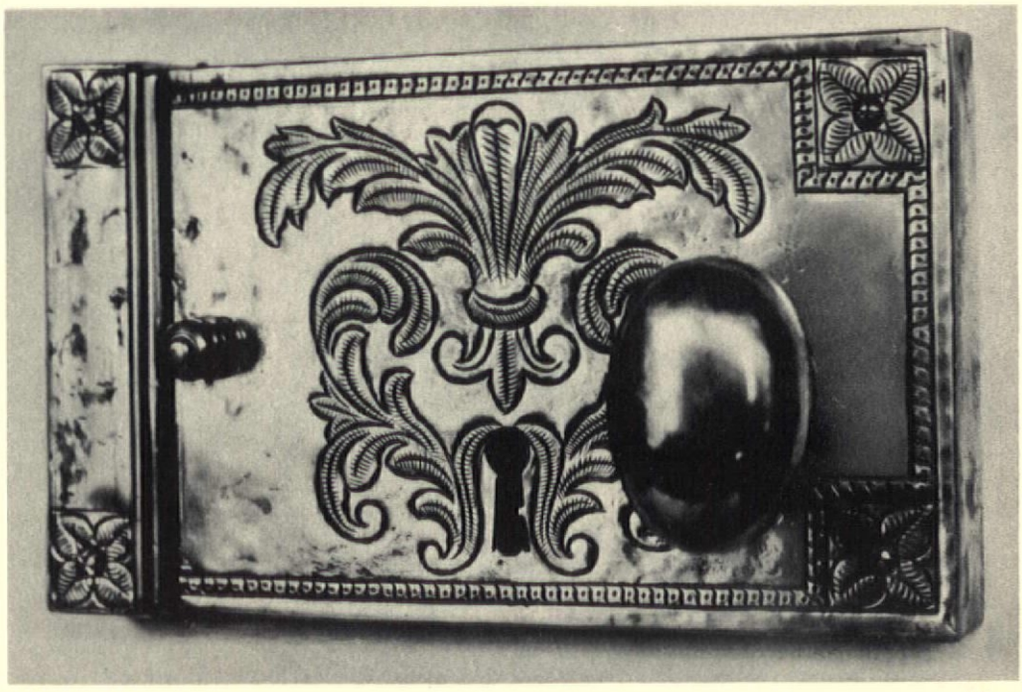
*The knockers below and to the right, both of German silver, are in the residence of A. F. McNichol at Greenwich, Conn. (H. T. Lindeberg, architect). The knocker below is 9 inches high over all, and 5 inches wide. German silver is easily worked, a quality which the design reflects*





*When it is an advantage to conceal the actual means by which the rim lock is secured to the door, the ingenious craftsman has a problem in which he revels. Often ornamented screw heads, or false screw heads, are resorted to, but here the raised leaf portions do the trick*

*For certain periods of architecture or furniture it is sometimes advantageous to introduce the yellow color of brass, and while this material is usually thought of as being primarily suitable for casting, it also is excellent for hand tooling, as is evidenced by this rim lock*

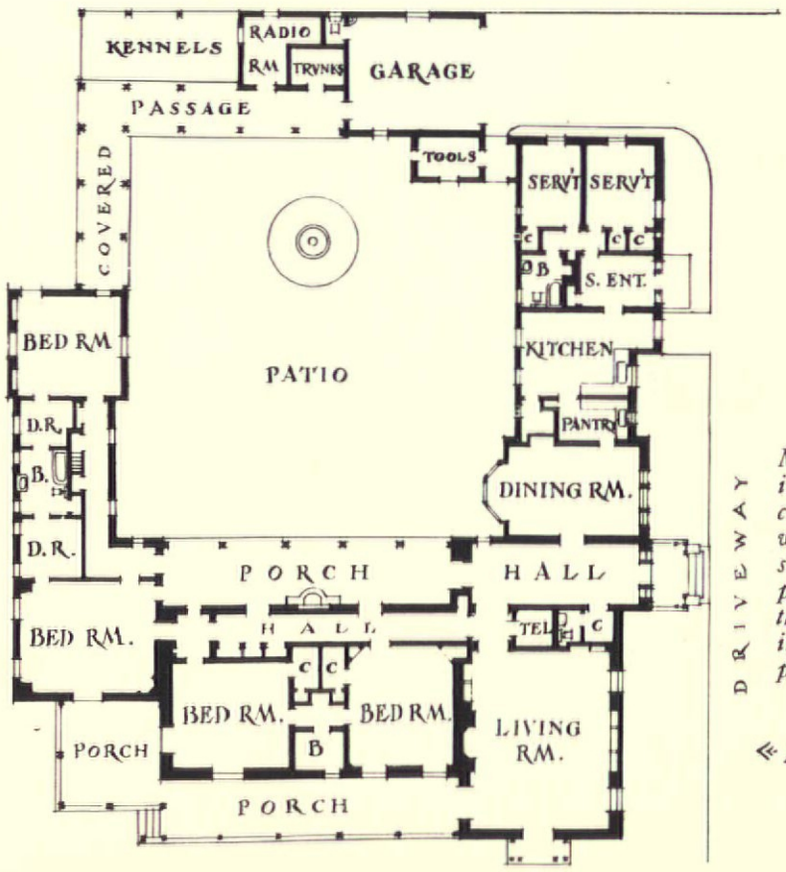




*Photographs by George D. Haight*

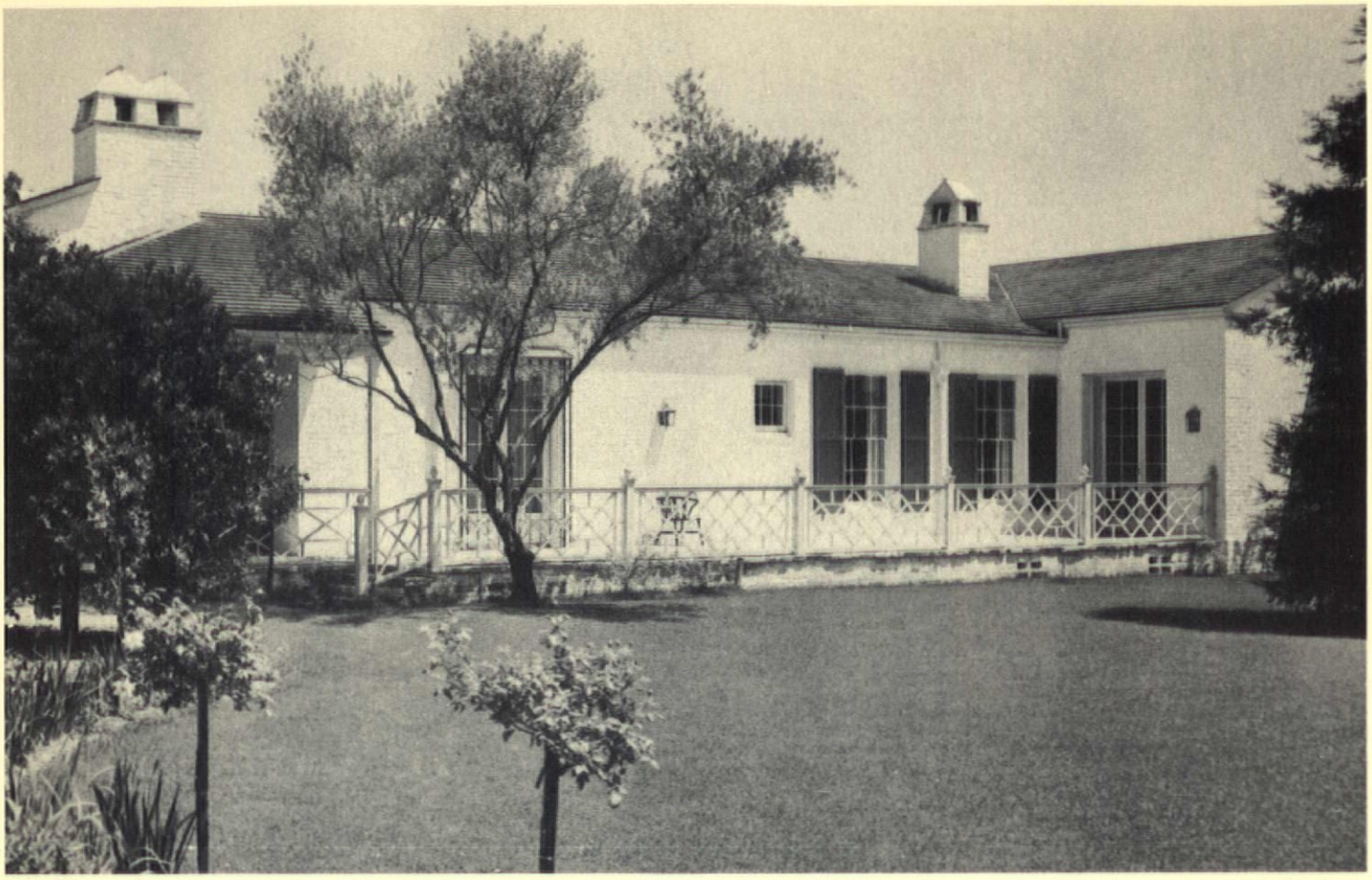
# House of LeRoy Kellogg, Pasadena, Calif.

GARRETT VAN PELT, JR., ARCHITECT




*Like most successful country homes in California, the lines are long, low and spreading, in proper humility to a setting that is dominated by the surrounding mountain ranges*

*Mr. Kellogg's house is built around the customary patio, which gives the designer abundant opportunity for roofing the various portions in a manner to express the elements of the plan*



*A porch extends along most of one end of the plan, leading from a corner of the living-room and across two of the main bedrooms. The walls are of brick, painted white*



*Another view of the porch. It is interesting to note the pleasing combination of the early California ranch-house type with its wood-work, and the Spanish window grille of wrought iron*



*Inside the patio. At the extreme left may be seen the bay window forming one end of the dining-room. Color has been secured by the use of brick paving and a few simple tiles*



*Mr. Van Pelt has achieved an unusual and quite pleasing chimney top by the use of stepped-back brick supporting a cast concrete cap*



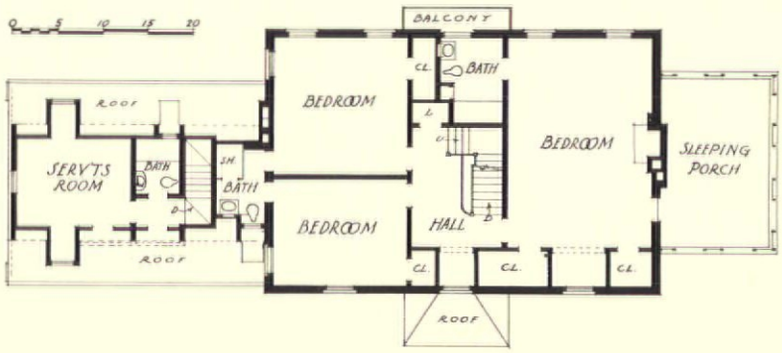
*The living-room takes its key from the furniture of English antecedents—a common concession to those who bring to California an Anglo-Saxon background*

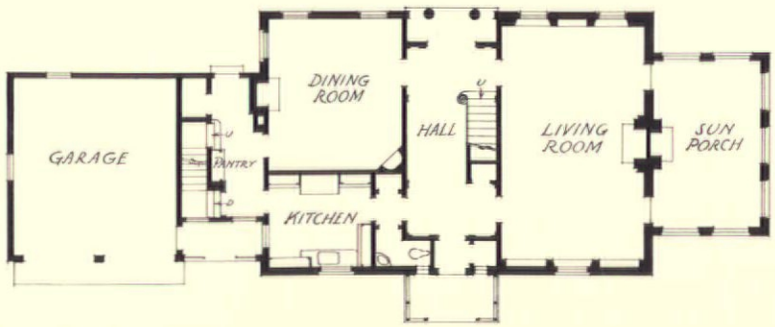


*Photographs by Richard Averill Smith*

# House of O. F. Miller, Kalamazoo, Mich.

## AYMAR EMBURY II, ARCHITECT




*Mr. Miller is a building contractor, so that, in plan and materials chosen, his own house reflects the discrimination gained from years of experience in building for other home makers*



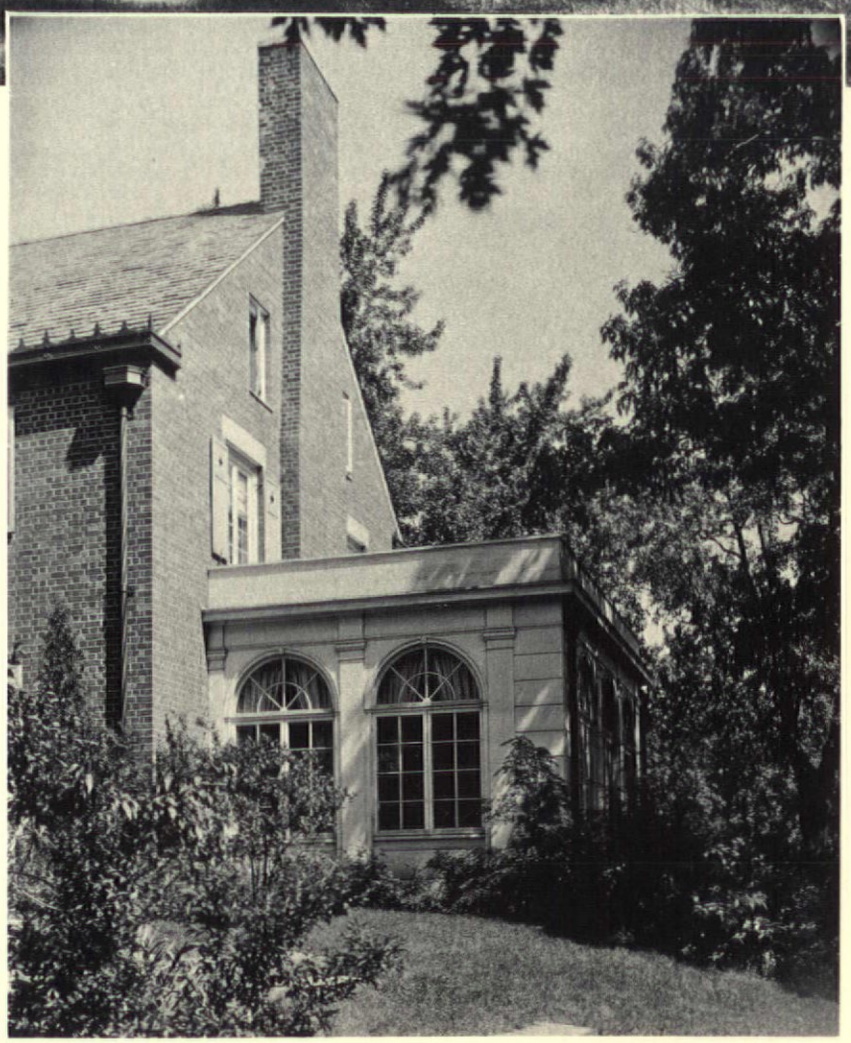
*The brick is a local product in soft reds, having considerable variation of tone. A buff mortar is used to tie these together*



*The entrance porch has always been a point of concentration for the designer's activities; here is one that shows a new and refreshing treatment of the supporting members*



*Above, the garden side of the house. The shutters are white for the first story and green above*



*At right, the sun-porch end. The gutter along the eaves of the main roof is made of copper with a cut-out cresting, and the gutter is further embellished by the use of stock lead rosettes such as are used in leaded glass*



*Above, a pictorial wall paper is used in the dining-room, its dominating colors being grays and buff. The woodwork is slightly off the white to tone in with the paper. Inside of the corner cupboard the wall is painted a bronze yellow*



*At left, the main hall. Here the woodwork is a gray white, with some of the ornament picked out in gold*



*Above, the fireplace side of the living-room. A gray buff block-printed paper is used, the woodwork glazed over white to harmonize with it. Below, the sun porch has stucco walls of pale buff, with strong color in the hangings. The paving is of green, black, and purple slate*



# Fair Weather

## AIR CONDITIONING AND THE OLFACTORY SENSE AS THEY RELATE TO INTERIOR DESIGN

*By Carleton B. Ryder*

*"Everybody is always talking about the weather but nobody ever does anything about it."*

—MARK TWAIN.

*Here is the second of Mr. Ryder's articles dealing with what might be called organic structure. Last month "The Neglected Sense" carried acoustics forward into esthetics. Next month we are to have a revelation of the possibilities in lighting.*—EDITOR.

IT is not facetious to say that such a remark as the foregoing may have played an important part in the development of air conditioning to its present scientific prominence. Even a subtle challenge to one of the dominant primary urges, such as the obstacle to mastery implied above, may provoke worldwide forces. Subconsciously, or not, Mark Twain's quip was well put.

The prevalent reaction to a thwarted urge is to nominate it for oblivion. This we can thank for the faction that considers "fair weather" unimportant, and promotion of air conditioning a "racket." A little attention given to the investigations of the well-known climatologist, Mr. Ellsworth Huntington, reminds us that, estimating the average value of a human life as only $7000, a sudden hot spell in June, 1925, cost the United States $100,000,000. A reverse weather change in February, 1926, cost $500,000,000. In spite of the great toll of those two "snaps" of weather no one thought of relief measures! Climatologists can demonstrate the correspondence of climatic change with the decline of "the glory that was Greece, and the grandeur that was Rome." Even the layman may observe that fashion abides by the dictates of weather—if nothing else. The reason for English "bag" trousers is that the dampness of mode-setting London renders the permanence of a crease impossible!

Although mastery of sun and climate is still beyond our reach protection can be had in shelter. Scientists, physicians, engineers have "done" much "about the weather." The American Society of Heating and Ventilating Engineers and other foundations have been formed for the co-ordination and sponsorship of such work and research. Now residence, apartment, office, or other structure can number "fair weather" among its furnishings.

This inspection must, due to the size of the sciences involved, confine itself to briefs of physiological cause and effect, psychological cause and effect, relation of the two to interior design, with conclusions on the indicated trend of development.

The air acts in two ways with respect to its physiological effects:

1. As form of sustenance.
2. As aerial envelope.

The first refers to the useful gaseous composition of the air for assimilation into energy through the lungs, also modifications of usefulness by suspended foreign matter, such as smokes, fumes, dusts, bacteria, and so forth.

The useful components are too well known to concern us here. Modifiers of usefulness are more important. The not uncommon quantity of impurities in air is evidenced by measured soot fall of over one thousand tons per square mile per year in Pittsburgh. Carbon monoxide, lead, and other poisonings following from industrial contamination are constantly detrimental and occasionally serious. Bacteria require other agencies, such as deterioration of lung action by dust or other deposit, drying up of mucous protection, and increased susceptibility due to upset bodily thermal balance, if they are to be effective. It is a common fallacy that undetermined toxic matter can be substituted for useful components through respiration. The effect of carbon dioxide in vitiated air and general pollution is relatively unimportant in comparison with optima in other respects.

The term aerial envelope refers to all effects of enveloping air upon retention of the body's thermal balance, and comprises four or more variables:

1. Temperature.
2. Humidity.
3. Motion.
4. Ionization.
5. Unknown

The first three may be combined into a single index (as shown in Figure 1) known as Effective Temperature index, since each contributes to the sensation of warmth felt by the human body.

A physiologic sketch may explain this interrelation. The body strives to maintain a normal thermal level of about 98.6° F. Maintenance is effected by heat production and heat loss. Metabolism, the combustion of food, produces

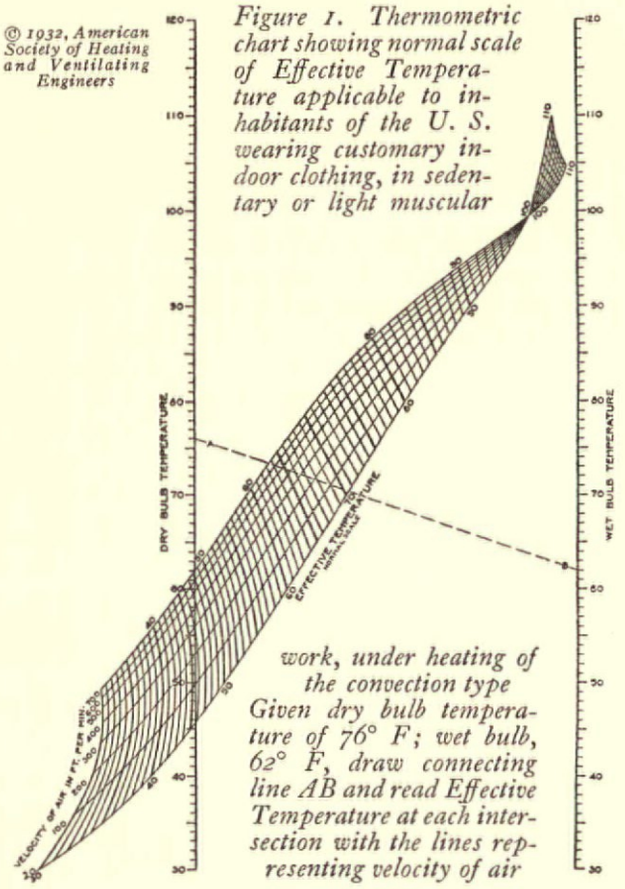



*Figure 1. Thermometric chart showing normal scale of Effective Temperature applicable to inhabitants of the U. S. wearing customary indoor clothing, in sedentary or light muscular work, under heating of the convection type Given dry bulb temperature of 76° F; wet bulb, 62° F, draw connecting line AB and read Effective Temperature at each intersection with the lines representing velocity of air*

heat which emanates from the body surfaces by radiation, convection, and evaporation. A most intricate sense-nerve-muscle sequence functions —a veritable human thermostat—to regulate this emanation by co-ordinated control of the chemical heat production, the cutaneous or surface blood circulation and operation of sweat glands.

Now, if external temperatures are low with relation to internal, constriction of cutaneous capillaries reduces heat loss. Increased adrenalin secretion facilitates internal heat production. If external temperatures are relatively high, automatic inhibition of heat-producing organs, such as the liver, follows together with expansion of surface capillaries. The sweat glands are set in operation to cool by surface evaporation of moisture, and for faster waste clearance.

As a result it follows that the rate of evaporation is regulated by the amount of water vapor already present in the air; it is further affected by the bulk of air brought in contact with the body through air motion. Convection from the body is likewise affected by air motion. Thus we see the contribution of several factors to the combined index termed Effective Temperature.

Adaptability of the body is only efficient within certain limits. Prolonged subjection to high temperatures results in abnormal rises in metabolism, body temperature, heart action, respiratory rate, rate of chloride loss in perspiration, and may lead to organic failure. At 100° Effective Temperature the human body *at rest* averages a pulse rate increase of forty beats per minute per hour, and a weight loss of 1.7 lbs. per hour. Under conditions of excessive cold equally detrimental effects take place in the unprotected organism.

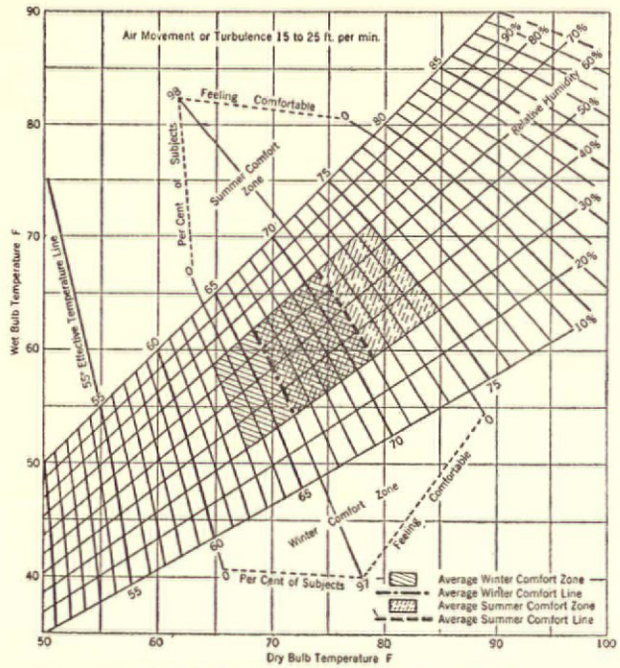
The American Society of Heating and Ventilating Engineers, as the outcome of manifold research conducted in co-operation with U. S. Public Health Service and U. S. Bureau of Mines, have prepared a chart of Effective Temperatures to which are applied zones of comfort for winter and for summer. This "Comfort Chart" is illustrated in Figure 2. Other determined optima for specific types of work, and still others for effects on materials wherever shrinkage or expansion is an industrial factor, may be obtained from the publishings of the A. S. H. V. E.

Air-conditioning systems are now designed so as to maintain constant air purity, humidity, movement, and temperature at an "optimum" indicated by the "comfort zones." But much study is being focused at present upon the probable importance of Effective Temperature fluctuation. The subject is being approached from two viewpoints. A group most intimately associated with practice, such as Dr. W. J. McConnell, of the Metropolitan Life Insurance Company, and C. P. Yaglou, of Harvard School of Public Health, both of the A. S. H. V. E., recognize the inability of a mean comfort line to suit every one. Another group more devoted to research, such as Dr. C.-E. A. Winslow and Dr. Leonard Greenberg, of the Yale School of Public Health, believe reasonably exercised adaptation to be of physiological importance.

The tests by which the "comfort zones" with their mean "comfort line" were determined showed considerable difference of opinion among the test subjects; also each subject's individual line of greatest comfort varied from time to time.

The latter results from a complication of variables, such as type of work, clothing, habitual exposure, changes in the rate of metabolism. This abbreviates the need for a happy medium or some effective equivalent.

The second argument is brought out by figures that, for example, show an average lowering of the death rate during moderately stormy—changeable—periods. In general, continued subjection to uniformity of temperature, such as




© 1932, American Society of Heating and Ventilating Engineers

*Figure 2. Comfort or Effective Temperature chart for air velocities of 15 to 25 f.p.m. (still air). This applies to inhabitants of the U. S., and the winter zone is further limited to rooms heated by systems of the convection type. Summer comfort zone is limited to homes, offices, etc., where occupants become fully adapted to the artificial air conditions—not to theatres, department stores, and the like*

extended calms of warm or cool weather, develops specialization at the expense of adaptability. The result is lowered resistance. For example, decreased adaptability means delayed reactance to change. The capillaries in the mucous membranes contract during an even cool spell; a sudden temperature rise finds them unprepared to expand at a normal speed. Bacterial growth gains headway before counteractive forces are resumed. A cold may result.

Furthermore, the human body is subject to what is known as "sensory thresholds," when detecting changes in degree of sensation. A violin readily audible in a quiet room would not be heard if the player were to take up his stand upon a busy thoroughfare. The proportionate increase in sound volume is insufficient to trip the sense "relay" that delivers the violin stimulus to the brain. The same applies to variations in temperature and even differs with the direction of the shift, because the number of warmth receptors, or sensory endings, is considerably less than that of cold receptors. This characteristic intensifies the effect termed "unpreparedness," *but suggests the practical means of solution.*

The separation between positive and negative thresholds of temperature sensation amounts to actual degrees Fahrenheit. Therefore, fluctuation within the "comfort zone" may be so timed and so limited that it would be between conscious thresholds of most people and yet, due to sensation lag, only be slightly noticeable to extreme subjects. The effect would be maximum or near maximum comfort for every one, with imperceptibly exercised adaptation—the practical "happy medium."

A method of this nature can be applied through existing air conditioning apparatus with little further study and would probably initiate notable improvement. But a great step is imminent.

Heat may be transmitted by convection, conduction, radiation. The first two methods constitute heating of a medium, such as air or matter, by contact with the source of heat. Transmission is effected by movement of air or homogeneous contact of matter. These are the methods most employed today. They make no discrimination as to thermic *character.*

Heat may be transmitted by direct radiation, or, to be more exact, induced by the resistance set up when an object or person intercepts radiant energy of certain wave lengths or frequencies.

A radiant energy spectrum is about equally divided by the frequencies visible in the form of light. From this division, as the frequencies decrease or the wave lengths increase we traverse the "infra" side of the spectrum. Reversely, as frequencies increase and wave lengths decrease we traverse the "ultra" side. The difference in type of energy between the "dark" or low frequencied rays and higher frequencied rays may be characterized by an analogy. Dynamite drives wedges of energy into a boulder, breaking it, and hurling the fragments some distance. Fulminate would pulverize a part of the

same boulder and leave the rest intact. The "dark" rays resemble dynamite. They are slower in action, appear to flow around objects or pass through fissures, longer retain their energy. These are the type of rays emitted by common heating surfaces—radiators, stoves, and so forth. The higher frequencied rays resemble the fulminate. They have great speed of action, penetrate deeper into obstructions, but sooner exhaust their energy.

It will be seen that certain rays may be fast enough to permeate the body and yet not so fast as to dissipate their energy before reaching a beneficial depth. A few of the still higher "ultra" spectrum waves cause important physiochemical reactions, near the surface of the body, having a beneficial effect upon the blood, but are ineffectual as heat producers. Both of these types of solar radiation, as expressed in the words of Professor C. P. Yaglou, Harvard School of Public Health, are "not merely desirable, but essential to life." This is the thermic character that present heating systems lack.

There is now in development a new type of electric bulb that will emit visible and invisible radiant energy similar to sunlight but exclude harmful rays. It will deliver them in sufficient intensities to be of practical use as a heating element. This offers the solution to heating and air conditioning. It may also control the fourth characteristic of air, its electrical potential or ionization.

Pure outdoor summer air approximates a potential and polarity of about 560 positive ions and 500 negative ions. This is subject to change both in sum and balance. Little is definitely known concerning the physiological effects traceable to this quality; although experiments have indicated the association of excess positive polarity with increased blood pressure and nervous decay, and vice versa. Under test, ionic potential in a room has been found to drop with human occupancy at such a rate that maintenance by change of air becomes prohibitive under at all crowded conditions. It is also probable that metal air-conditioning ducts materially affect the ionization.

With these deficiencies of prevailing systems and possible improvements in mind, the inferred design of a future air-conditioning installation may be forecast. It would employ the energy-radiant electric bulb so located as to diffuse its rays directly and indirectly throughout the room. Supplementing this, an air-conditioning system will introduce properly filtered, tempered, and humidified air in large volumes and at low velocities. Thus drafts are obviated, predicating effectual structural insulation. The convected temperature would have a mean of about 55° F. to maintain the refreshing quality of the air in contact with the body. The radiant energy holds Effective Temperature up to the "comfort" level and keeps all surfaces or objects upon which it falls at a temperature that will prevent convection to or from undesired sources. This precludes sensations of heat or cold upon physical contact or approach. Relative humidity will be fairly high, about 55 or 60 per cent, simulating the outdoor relative humidity, considered most healthful. This will also minimize dust suspension. Lastly, the previously mentioned fluctuation might be obtained through varying velocity and direction of air motion, thus varying Effective Temperature. This fluctuation should be extended to compensate for natural changes in internal heat production; there should be compensation for higher body temperatures during and after eating and toward the end of the day. In office applications the control might vary before and after hours of exposure so as to reduce the contrast between interior and exterior Effective Temperatures.

It is at this point that development of the subject proceeds from physiological to psychological considerations.

The present-day pioneers are precisely those who are advancing into the latter field of research. The human equation cannot quite be determined without the aid of psychology. The implication that the modern technical air-conditioning engineer must needs become a psychologist might by some be construed as the insult upon injury, but its truth cannot be better defended than by a review of the logic of the first paragraph.

In the previous article, "The Neglected Sense," crude generalizations on the psychological factor were given. Here it will be well to trace in greater detail the sequence from effect to cause. The sensory receptor reacts to stimulus. The reaction is then relayed through the nervous system. The nerve centre receives the impulse, classifies it, and files it for the immediate attention of other nerves whose office it is to stimulate the proper muscles for compensative or protective reaction. A single sensation impulse is not confined to a single neural path. Instead there are interconnections between almost every path. Usage is the principal

determinant of the course of the impulse. The resistance to impulse flow through any particular sequence is decreased with exercise.

In the first place, organic needs determined certain sequences. In the second, heredity either confirms or modifies such primal sequences and instigates new or more complicated ones. With these two types of sequences we are born. Thereupon, environment, association, and personal habit begin to confirm or modify inherited sequences and instigate still others. It must be understood that this last process follows from exercising dormant connections.

Study of physiology and heredity has reduced the fundamental reactions or responses to well-defined constants. Inasmuch as habit, association, and environment are largely derived from heredity, the personally inherited reactions to stimuli may be determined within narrow limits; variations within these limits are almost entirely determined in childhood or youth. A study of that period of an individual's life will make it possible to predict with accuracy his reactions to any given stimulus.

This leads us to the conclusion that we have three specific types of reaction to contend with in applying the psychological hypothesis to air conditioning:

1. The habitual response.
2. The functional response.
3. The illusional response.

Admitted or not, the first is a name for the bane of the air-conditioning engineer's life. A highly perfected conditioning system may be installed and its benefits nullified by a personal belief that windows must be opened. Exhaust grilles may be insulted with a conviction that they are sources of drafts. The most efficient automatic controls may be rendered superfluous by an individual's opinion that he "knows better," though as a matter of fact his knowledge may be confined to politics! Frankly, the only plausible solution here is to "play politics," to concede the point openly and deny it in fact.

Definition of the second or functional response is derived from knowledge of hereditary modifications. The determination is less personal, and more easily applied. Through control of these reactions one may facilitate the pursuit of a given occupation. By association, one may reversely produce anticipation before the occupation presents itself. It is self-evident that application to air conditioning must vary to conform to the purposes of different rooms; it must also vary temporally.

An Effective Temperature spectrum for functional response is derivable. Its lowest end corresponds to the highest degree of physical work or metabolism. Temperature increases with the decrease of internal heat production, is midway for mental work and reaches the highest end of the spectrum when complete relaxation or sleep is desired.

An ionization spectrum displays association of positive predominance with nervous tension, of negative predominance with nervous relaxation.

A radiant energy spectrum displays association of the lowest frequencies with general lassitude, of the higher with alertness.

An olfactory spectrum of functional reaction deserves more comment. It is by the olfactory or sense of smell that we not only evaluate the purity of the air as sustenance but qualify the condition or object accessory to the gases detected by the organs of smell. But the multiplicity of conditions or objects to which this sense may be applied is so varied that in generalizing the only common factor is appeal or repulsion to the appetitional instincts. Desirability or appeal may be associated with appetizing or fragrant odors, repulsion with nauseous or acrid odors. Specific problems of this sort are not difficult to analyze and solve chemically in the laboratory. For that reason it is entirely unnecessary that present or future generations be constrained to put up with unpleasant odors such as those of linoleum, carpet, rubber, leather, fabric, paint, plaster, and innumerable other common materials, when they can not only be deodorized, but be given odors that will promote the use to which they may be put. Dr. D. A. Laird, Director of the Psychological Laboratories of Colgate University, has gone so far as to investigate the psychological responses to perfumes and odors, and found them a material factor for commercial purposes. There is no better human barometer than sales.

The last of the three types of response, the illusional, may be defined as the manipulation of response for ulterior purposes. As previously indicated, the sequence from stimulus to response may flow through various channels. Two or more stimuli may contribute to the same response. If two stimuli have become habitually associated in producing a response, the presence of one without the other will not only produce the response, but imply the presence of the other though it be absent. This is illusion and is widely employed throughout interior design. With

particular reference to the subject of air conditioning, it is possible to convey impressions of nearness of a surface by concentrating warmth upon it, of distance, by increasing its coldness. Reactions of warmth may be produced by glow, even brightness of color, and vice versa. Control of ionization may produce sensations of intimacy in a large room and seclusion in a small one though it be crowded.

To conclude, all variations for psychological reasons should be applied within the extreme boundaries of physiological comfort zones. In procedure a conditioning installation such as that described before would be adjusted for a temporally varying physiological comfort zone. Next, function will determine the comfort line within that zone and be subject to modification according to psychological needs. Then about the thus determined comfort line as a median the Effective Temperature will oscillate within the boundaries of the initial comfort zone. Lastly, radiant heat may receive additional concentration on certain surfaces, and may be controlled for illusional reasons.

The writer believes it evident that air-conditioning design is most intimately associated with interior design. The air-conditioning engineer is prepared for, and looking to, such progress. His co-operation may be considered an assured fact, and his advice should be indispensable to the interior designer.

The elaborate and novel appearance of the theory of air conditioning herein proposed and predicted must not be construed as indication of its remoteness. It can be adopted in part today, in greater part tomorrow. But the possibilities for tomorrow are the direct result of today's study. Research is only restricted by demand and that demand must come from the readers of this article. So, with emphasis again directed back to the initial importance of "fair weather," it is hoped the subject will "not be nominated for oblivion."

## BIBLIOGRAPHY

*(With acknowledgments for much of the foregoing)*


*The Pulse of Progress*, Ellsworth Huntington. Charles Scribner's Sons, publishers, New York.

*Civilization and Climate*, Ellsworth Huntington. Yale University Press, publishers, New Haven, 1924.

*Studies on the Industrial Dust Problem*, Leonard Greenberg. United States Public Health Service Bulletins, 1925.

*How Human Beings Respond to Changing Atmospheric Conditions*, W. J. McConnell. Amer. Inst. of Min. and Met. Eng., *Technical Publication* No. 319, 1930.

"Physiological Responses to Heat," H. C. Bazett, *Physiol. Rev.*, *7*, 531, 1927.

"Humidity and Comfort," W. H. Howell, *The Science Press*, April, 1931.

"Effective Temperature with Clothing," C. P. Yaglou and W. E. Miller, *Trans. Amer. Soc. Heat. and Vent. Engs.*, *31*, 89, 1925.

"Effective Temperature as Applied to Industrial Problems," C. P. Yaglou and W. E. Miller, *Trans. Amer. Soc. Heat. and Vent. Engs.*, *30*, 339, 1925.

"Determination of Equal Comfort Zone," F. C. Houghten and C. P. Yaglou, *Trans. Amer. Soc. Heat. and Vent. Engs.*, *29*, 361, 1923b.

"How to Use the Effective Temperature Index and Comfort Charts," Report, *Heat. Pipe. and Air Cond.*, June, 1932.

*Guide*, Amer. Soc. Heat. and Vent. Engs. New York, 1932.

"Air Conditioning," C. T. Larson, *Architectural Record*, September, October, 1932.

"Humidification for Residences," A. P. Kratz, Univ. of Ill., *Eng. and Station Bulletin* No. 230, 1931.

"Are Present Methods Too Crude to Endure in Air Conditioning?" C. P. Yaglou, *Plumb. and Heat. Conts. Trade Jour.*, March, 1932.

"Changes in Ionic Content in Occupied Rooms Ventilated by Natural and Mechanical Methods," C. P. Yaglou, *Jour. Sect., Heat. Pipe. and Air Cond.*, October, 1931.

*Fundamentals of Objective Psychology*, J. F. Dashiell. Houghton Mifflin Company, 1928.

*The Fundamentals of Human Motivation*, L. T. Troland. D. VanNostrand Company, 1928.

OTHER AUTHORS

C.-E. A. Winslow; W. D. Jordan; C. A. Mills; Philip Drinker; W. W. Teague; U. Miura; W. P. Yant; W. H. Carrier; Perry West; E. B. Titchener; A. I. Gates; F. E. Hartman.

# Some Pitfalls in Supervision

*By W. F. Bartels*

XXVII. ORNAMENTAL IRON AND BRONZE

*(CONTINUED)*

BEFORE setting the saddles the superintendent should check both the architect's drawings and the shop drawings. Then he should inspect the saddles to see that they fulfill all requirements. They should be the full width of the opening, yet on many jobs one may observe saddles short of each jamb by as much as one-half inch. If, on one or both sides, the saddle is supposed to be met by marble the superintendent should check the marble shop drawing to see that this is provided for. This may avoid delay or an unworkmanlike condition of the marble being short. When being set the saddles must be carefully checked. Any deviation from the correct level or elevation will be obvious very quickly when the finished floors are laid. Many sloping stair platforms and disagreeable looking humps at thresholds can be traced to improperly set saddles. The superintendent must see that all saddles are well grouted. In the case of exterior doors it may pay to have the saddles set in mastic. This will often prevent the seepage of water underneath resulting from a stiff rain.

If the buck has been set true it will not be difficult to set the trim properly. If it has not, however, the mitres of the trim will probably be broken and will not fit the buck snugly, causing an altogether shoddy appearance. Likewise the hanging of the door must be done carefully. A certain allowance for clearance at the edges has been made in the construction of the door. Hence if the buck is properly set and the saddle is at the correct elevation the door will be hung with little difficulty. The superintendent should endeavor to prohibit the padding of hinges. This results only in an uneven ugly crack between the door and its frame.

A section of the door, as well as a full description of the materials composing the door should be furnished to the superintendent, whether it be the main entrance door or only a small access door. They may both appear on the job made of thinner or cheaper material than is called for. Then too, the finish of all doors, as well as the construction, must be carefully checked. The finish of ornamental doors often influences their construction and hence this must be checked to see that it will not be the cause of the mitres opening up or the metal covering pulling apart at the edge of the door. Often to cover small defects the exterior of the door will be so burnished or ground down that very little of the metal is left.

Ornamental windows should be carefully set and aligned. The material of which they are fabricated should be checked to see that it agrees with the specifications. The mitred work should be gone over carefully to see that there are no ugly gaps, solder and welding marks, resulting from the vain efforts to pull members together which really did not fit. Some contractors will fill up gaps, cracks or holes with a form of putty or other filler, and then hope it will not be detected because of its height above the ground. The observing superintendent will not let such practice escape him, and the contractor should be required to remove the faulty unit.

All grille work coming on the job should be examined as to design, material and construction. If it is cast it should be examined to see that it has been properly machined down, if this has been called for. Then too, there should be no excessively rough spots nor too many sand holes. If the casting is a thin one it behooves the superintendent carefully to examine all parts immediately upon their arrival. Sometimes breakage in the factory is blamed upon the job. Often it will be found that a breakage has occurred and that an ineffectual attempt has been made to remedy this by welding or patching of one sort or another.



In general the inspection of bronze work, as with iron work, consists of the examination of the material and the close inspection of the execution of the work. Color texture, hardness, and many other items are amongst those the superintendent must examine and be familiar with. But before attempting the inspection of bronze work the superintendent would do well to equip himself with several good treatises on architectural metals. Otherwise he will be besieged with so many terms for the same article that he will be not only puzzled but chagrined. With the many compositions of metals on the market today the time he may spend in their investigation will be well worth while.

# HARDWARE

HARDWARE holds an unenviable job in any building. If it works well it is soon apt to get no attention. If it causes inconvenience it comes in for an excess of attention. It is expensive and annoying to replace or repair hardware, so that what seems like a high initial cost may easily prove to be cheapest in the end.

At the present time, particularly in the building trades, many manufacturers of high-grade articles are turning out products below their usual standards in order to meet the fierce price competition they have been forced into. Care must therefore be exercised to obtain the specified articles upon which the manufacturer has made his reputation, and to be sure that the quality has not been lowered.

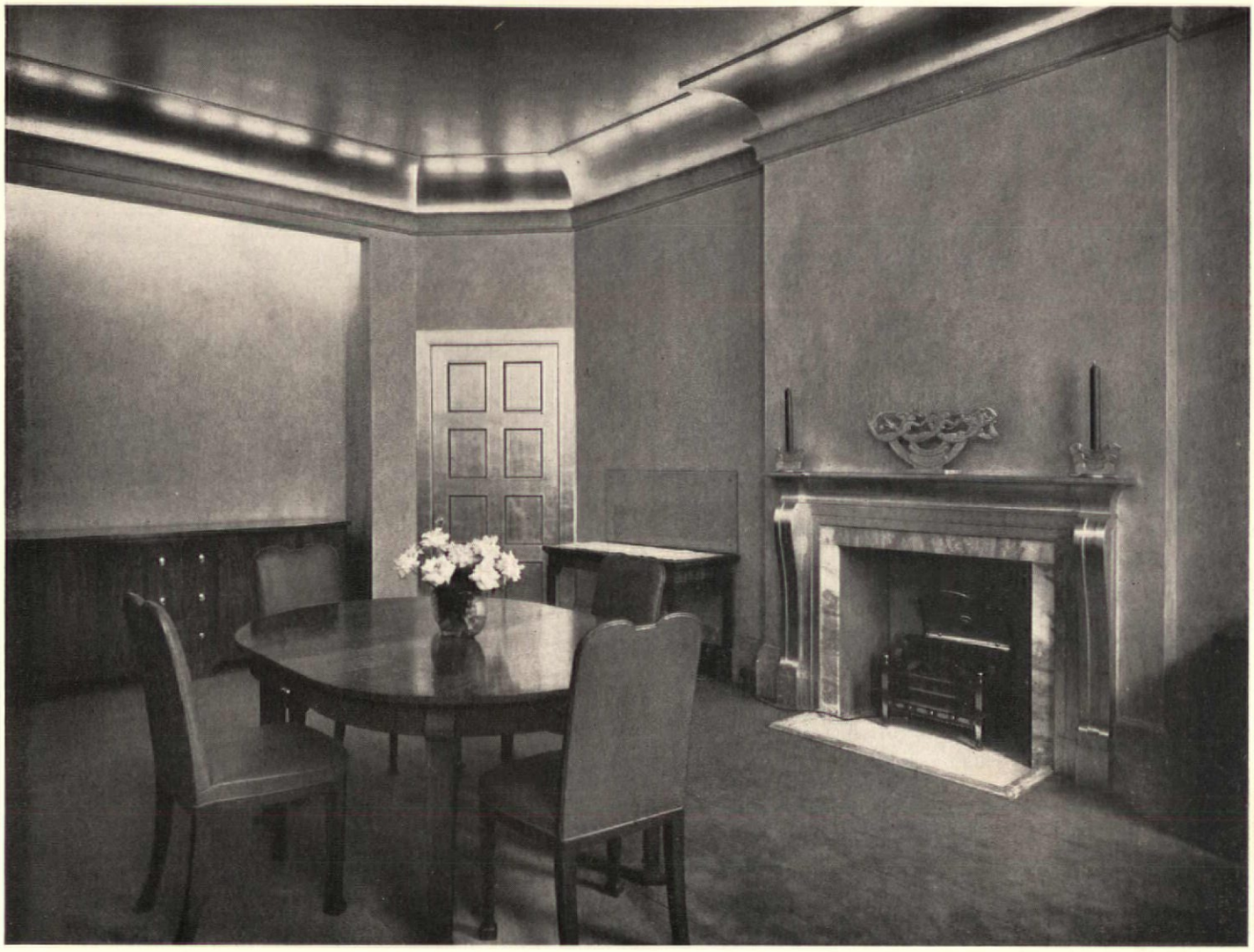
Hardware is usually visualized as consisting chiefly of locks and door knobs. Locks should work easily and efficiently. Often the face plate, instead of being solid brass or bronze, is merely plated. The case should be cast and the springs examined to see that they are of a good grade so that they will not lose their snap or else not work at all after six months' usage. The bolts should be long enough to catch. Among the cheaper locks the bolts are apt to be short. Used in inexpensive work they are particularly undesirable, because it is in this class of work that door shrinkage, settling, and poor alignment of plate and lock most commonly occur. Hence, after a few months in such installations bolts may catch by only the smallest fraction of an inch, thus adding to the sense of insecurity. For cylinder locks it is indeed poor supervision that allows a good lock to be cheapened by plated trim on the outside of the cylinders. Bathroom locks are often operated only by a small knob on the inside. It is well to supplement this with a means of obtaining access from the outside in case of sickness, fainting, or a child's locking himself in. A key best serves this purpose.

Knobs, escutcheons, and roses are stamped, cast, wrought, or spun. Stamped types are less desirable because of the thinness of the metal, and hence less expensive—except in those cases where they are well plated and palmed off for the real article at a slightly lower price. Cast types are more desirable from every point of view. Glass knobs should be so well made as never to come off in one's hand. The superintendent should be sure that the knobs, butts, window catches, pulleys, etc., are of the style and material specified. After proclaiming loudly that the hardware is cast brass or bronze, many a contractor has been seriously embarrassed when the superintendent has taken out a small magnet and found that it was so attracted to the "brass or bronze" that it stuck fast to them. Of course the usual alibi is: "I took my dealer's word for it." As alibis go it is a splendid one, for there is no law compelling the hardware contractor to previously test the hardware himself instead of taking his dealer's word for it.

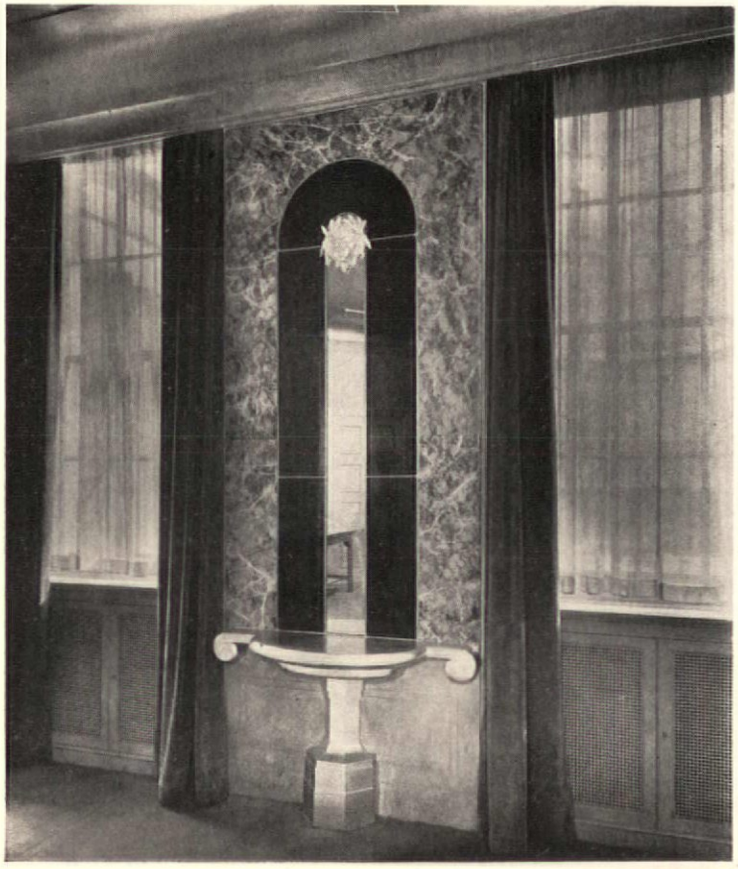
Window pulleys should not be passed over lightly—except by the sash cords. At first glance they seem unimportant. But if their every-day use is considered it will be seen that they should be chosen with care. The common variety is stamped. These are the least expensive. Preferable are those of cast iron, brass, or bronze. After paying for high-grade sash cord (Sheridized or a similar grade of sash chain) it is false economy to jeopardize their functioning smoothly by using an inferior pulley.

Similarly, in door springs and door checks, an inadequate or inferior article should not be used. Spring hinges on apartment and office doors are subjected to heavy and oftentimes abusive use. They should be of a size commensurate with the door size and usage, and of such caliber that they will need but little adjusting and less repairing. Door checks should be chosen with due regard to the size, weight, and location of the door. Heavier doors obviously require heavier closers, and doors opening to the outside should have allowances made for the wind which may affect them. Doors opening at high elevations (penthouses, etc.) are subject to severe winds and therefore as an additional precaution should have chains bolted through the door and connected to the frame so that on opening the door in a gale it will not be torn off the check. In the installation of floor door closers it should be required that they are substantially fastened. Many mechanics are prone to use plaster of Paris in setting them, evasively stating that they will "fix them up later" or that the "floor will hold them in position." The former is forgotten more times than remembered, and the latter is only partly true. The use of plaster of Paris in a cinder fill cannot be expected to last very long.

*(To be continued)*



*In the dining-room the plastered walls have a slightly rough parchment surface, and are painted café au lait with a trace of pink. Coved cornice and ceiling are covered with silver-leaf lacquered a very pale gold. Carpet is mouse color; furniture of rather light walnut with a strongly defined grain; the leather upholstery, jade green*



*One end of the dining-room, with its black-glass-bordered mirror surrounded by green scagliola, with curtains of jade-green velvet*

DESIGNED BY
ROBERT W. SYMONDS AND
ROBERT LUTYENS

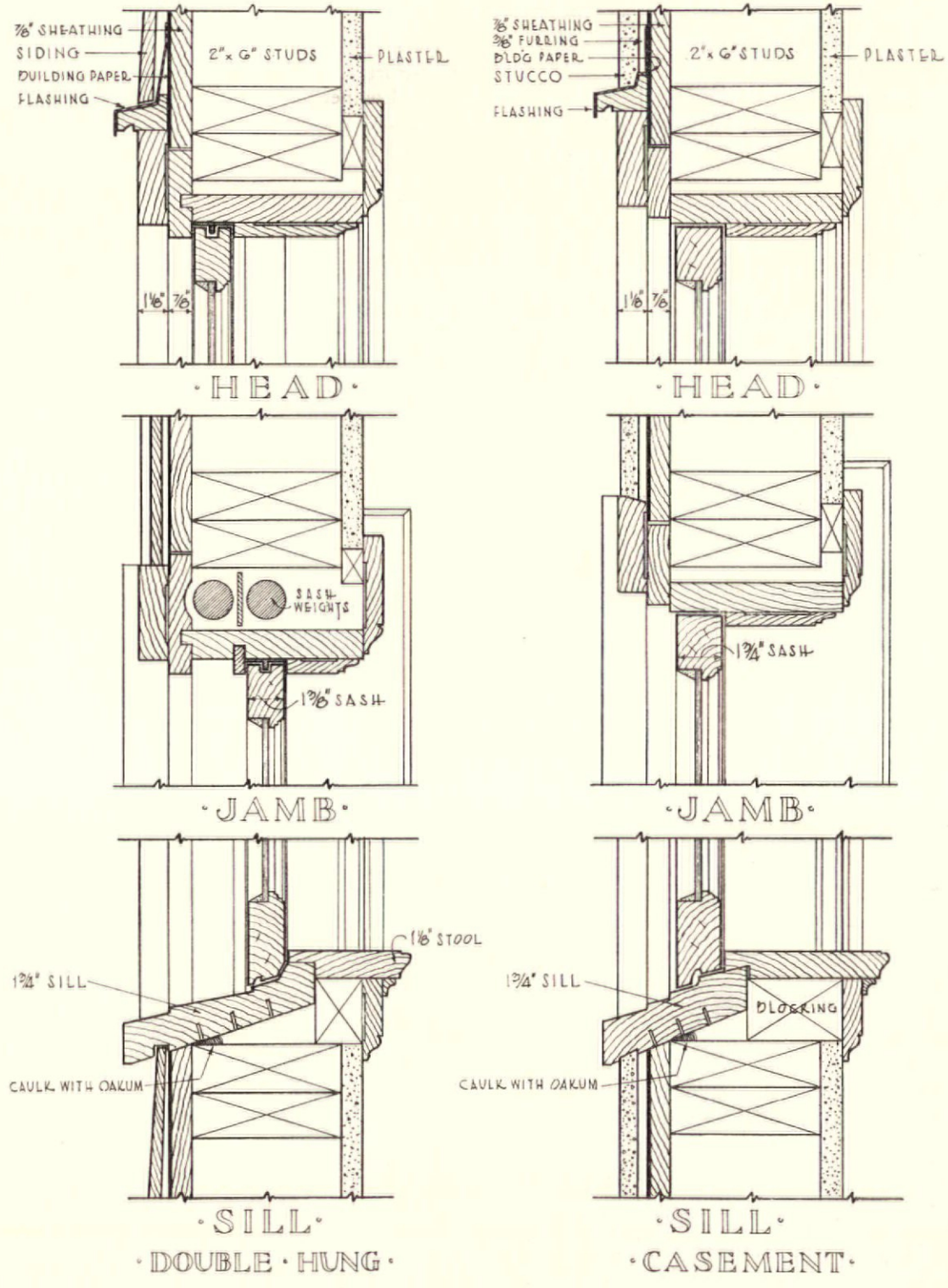
# Interiors of a London House



*Back drawing-room, the shape of which resulted somewhat from the fact that the work is an alteration. The semi-circular coves above the book shelves are of silver-leaf lacquered, reflecting concealed lighting. The windows also have concealed lighting diffused down from the curtain heads. Wall surfaces here too are slightly rough, painted an elusive peach, modified by parchment brown. Curtains are of apricot silk poplin. Furniture is upholstered in champagne Roman satin*

*In this bedroom the plaster walls have a deep cream parchment finish; the woodwork is also cream; and the curtains blue. The ceiling is sky blue irregularly clouded with gray. Here again the lighting is reflected from the semi-circular niches above the glass-panelled cupboards*






# ·CASEMENT·AND·D.H.WINDOW·IN·FRAME·WALL·

A Series of Working Drawings by Jack G. Stewart

·SCALE: 0 1" 2" 3" 4" 5" 6"

·PLATE · No·32·

# BOOK REVIEWS

AN INTRODUCTION TO ARCHITECTURAL DRAWING. By Wooster Bard Field. 103 pages, 9 by 12 inches. Illustrations from drawings, plans and details. New York: 1932: McGraw-Hill Book Co., Inc. $2.50.

The author, who is Associate Professor of Engineering Drawing in the Ohio State University, attempts to explain to the beginning student the various kinds of graphic representation involved in architectural practice, with the idea of aiding his decision as to whether or not he should study architecture.

AN ARCHITECT MUSES. By William Roger Greeley. 98 pages, 5½ by 8 inches. Boston: 1932: The Beacon Press, Inc. $1.60.

Concerning architecture as a necessity, as a profession, as a commodity, a business, a pastime, as the vestal of the crafts, as an inspiration, a personality, and as a prophecy. A good book to present to a client who has no clear knowledge of what architecture is and does.

ACOUSTICS AND ARCHITECTURE. By Paul E. Sabine. 327 pages, 6 by 9 inches. Illustrations from photographs and drawings. New York: 1932: McGraw-Hill Book Co. $3.50.

Mr. Sabine's book is perhaps primarily a textbook for students. Secondarily, but by no loss of effectiveness in presentation, it clears up for the architect and engineer the results of recent research and laboratory experiments dealing with the control of sound in buildings. The necessary mathematical treatment has been held within the compass of two years of college training in mathematics.

AIR CONDITIONING FOR COMFORT. By Samuel R. Lewis. 244 pages, 5¼ by 8¼ inches. Illustrations from diagrams. Chicago: 1932: Engineering Publications, Inc. $2.

The book describes the fundamentals which have to do with heating and cooling for human comfort, gives the practical formulas for computations, and stresses, throughout, the close connection between heating and cooling systems.

PLANNING AND BUILDING THE CITY OF WASHINGTON. Edited by Frederick Haynes Newell. Foreword by Allen B. McDaniel. 264 pages, 5½ by 8 inches. Illustrations from photographs and drawings. Washington, D. C.: 1932: Ransdell, Inc., under the auspices of the Washington Society of Engineers. Retail, $2; founders edition, $3.

The history of Washington in its making is so full of good and bad efforts, wisdom and forgetfulness, progress and retrogression that it has never been completely told—nor perhaps ever will be. Here is a serious effort, however, through the Washington Society of Engineers, with the co-operation of the Washington Chapter, A. I. A., to put the record into available form. Alexander B. Trowbridge contributes the chapter on the "Federal Buildings and the Triangle Plan"; Colonel Grant on "Parks and Monuments."

THE DECORATION OF THE TOMB OF PER–NEB. The Technique and the Color Conventions. By Caroline Ransom Williams. 81 pages, 9½ by 12½ inches, 20 plates. Illustrations from photographs and drawings in black and white and color. New York: 1932: The Metropolitan Museum of Art. $8.

The Tomb of Per-Nēb is one of Edward S. Harkness's gifts to The Metropolitan Museum of Art. It was discovered at Sakkāreh, Egypt, in 1907, and first opened to the New York public in February, 1916. The author's researches deal with the wall sculptures and wall painting associated with the close of the Fifth Dynasty in the twenty-seventh century before Christ.

TESTS OF CELLULAR SHEET–STEEL FLOORING. By J. M. Frankland and H. L. Whittemore. 31 pages, 6 by 9 inches. Illustrations from photographs and diagrams. Research Paper No. 463. Pamphlet binding. Washington: 1932: U. S. Department of Commerce. 10 cents.

A METHOD OF PROCEDURE AND CHECKING SCHEDULE FOR PLANNING SCHOOL BUILDINGS AND THEIR EQUIPMENT. By John J. Donovan. Foreword by Samuel A. Challman. 361 pages, 7¾ by 10 inches. Illustrations from photographs and plans. Milwaukee: 1932: The Bruce Publishing Co. $6.50.

The author, who is an architect, shares with his fellow practitioners a system which he has developed in an extensive practice. The work is a check list developed in great detail covering all elements of schoolhouse work.

HOME ARCHITECTURE. A Textbook for Schools and Colleges. A Manual for the Home Builder and Home Owner. By Rexford Newcomb and William A. Foster. 336 pages, 6 by 9 inches. Illustrations from photographs and drawings. New York: 1932: John Wiley & Sons, Inc. $3.25.

The subtitle is almost sufficient description. The authors' plan of showing typical accessories by means of the manufacturers' catalogue illustrations would suggest an early need for revision, with the rapid march of progress.

# The Editor's Diary

*Tuesday, November 1.*—Dropped in at The Producers' Council meeting at The Architectural League and listened to a stimulating letter from Max Dunning, but had to leave shortly thereafter to judge an archæological problem at the Beaux-Arts Institute of Design, calling for the presentation of a Spanish *reja*. In spite of the fact that the programme called specifically for large-scale details, many of the students had apparently gained no real consciousness of what wrought iron is. Unquestionably it is one of the hardest things to build up in a designer's mind—a real feeling for the material in which he is expressing his design. Of course, the later Spanish Renaissance work in wrought iron did get rather far away from the forge in its simulation of finely cut mouldings, depressed panels, and intricate foliage, none of which seems to come very directly from the anvil and hammer.

*Wednesday, November 2.*—E. L. Norberg, of San Francisco, joined the architectural editors at luncheon today to present the details of an ambitious scheme on the part of the Northern California Chapter's Standards Committee to publish a sort of bibliography, index, and guide which would correlate the technical information of the day so as to make it more readily available to the architect when he needs it.

Buckminster Fuller was also with us to tell us of the progress his magazine, *Shelter*, is making in its effort to achieve what has usually been considered impossible—a journal supported primarily by its subscribers, rather than largely by its advertising revenue. Naturally there was considerable clash between Mr. Norberg's plans to improve and further the existing system, and Fuller, whose conviction is that the whole system has proven its unsuitability to this time and people.

*Thursday, November 3.*—Chester H. Rowell, speaking before the architects of California at the recent Del Monte Convention, said a number of good things, one of which was: "Even the fashions of 'unfashion' are just as standardized as the old academic standards. My impression of modern art is that the standard is, no matter how well you can draw, you mustn't!"

*Friday, November 4.*—From all accounts, Boston has been doing a splendid job in putting unemployed architects and engineers at the job of making a really comprehensive survey of their city in connection with its need of housing. They have assigned a dozen different sections of the city to a dozen architects charged with making preliminary surveys, preparing the necessary charts, and compiling the desired statistics as to occupation and other facts concerning these districts. Taken together, these will constitute the first complete architectural survey of the city, and will be of immense importance to the community in future problems of community planning, better housing, slum clearance, transportation and the like.

*Monday, November 7.*—Hobart Upjohn, Edward S. Hewitt, and I lunched with Forest Grant at the University Club, discussing with the last named his efforts, as Director of Art in the public schools, to inculcate the students with something of art appreciation. We were encouraged in that last season, through talks given by various architects to students and teachers, we had reached a total of twelve thousand students. This year's programme provides for a continuation of the work with the emphasis upon talks to the teachers rather than to large bodies of students, allowing the teachers themselves to pass on the information in ways that are better suited to the pupil's understanding.

*Tuesday, November 8.*—I am glad to see that Joseph, Ralph and Herbert Pulitzer are going to restore the memorial to their father which stands in the Plaza at Fifth Avenue and 59th Street. Apparently the limestone which was used to carry out Thomas Hastings's design was taken from an upper stratum of the quarry, and proved to be much too soft. The Pulitzer Memorial Fountain has been a very distressing eye-sore for several years, and it is good news to learn that the sculptural part of the fountain, which was designed by Karl Bitter and, after his death, completed by Isidore Konti, will again be made good to look upon.

*Wednesday, November 9.*—I see that the architects of Indiana are conducting a weekly building page in the *Indianapolis News*. The attempts to pass on to the public some dependable information regarding architectural matters seem to be somewhat spasmodic, but slowly growing in number. Indianapolis comes on the stage as New York in its *Herald Tribune* page goes off. Personally I think the latter died because of too obvious special pleading on the part of the architect contributors.

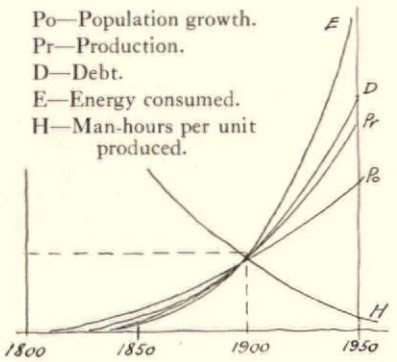
*Thursday, November 10.*—The Steel Joist Institute has just published the results of tests made at Columbia University to show relative fire endurance of a long-span, open-web, steel-joist floor protected with a ceiling of metal lath and plaster.

*Friday, November 11.*—A large number of Architectural League members gathered at luncheon in the clubhouse today to discuss ways and means of carrying the organization through some of the difficulties of the present emergency. Among the many emergency measures proposed there rang an unbroken note of confidence in the things for which The League stands, and which it so ably furthers. Occasions of this kind are always the more enjoyable because of the presence of many of the elder statesmen, such as Cass Gilbert, Benjamin Morris, and many others in whose affections and concern The League continues to hold a place that is unique.

*Sunday, November 13.*—Into a sleeper for Pittsburgh and found Robert D. Kohn, Clarence Stein, Henry Wright, Chester Aldrich, and Frederick Ackerman in the smoking compartment—all bound for the National Conference on City Planning. Ackerman has been working on some research, as usual, and has uncovered a fact which I have not heard mentioned before, namely, that technological progress is rapidly decreasing the amount of space required for industrial purposes in our cities. He cited one manufacturing concern which has not only decreased the number of employees by half within the last five years, but has also decreased the amount of space it requires one half. Coupling this fact up with the flattening out of our population-increase curve, it becomes more and more evident that our cities are not likely to need expansion about the perimeter as much as they do more careful planning and zoning in the interior.

*Monday, November 14.*—The Twenty-fourth National Conference on City Planning was opened at the Hotel Schenley with Charles F. Lewis presiding, director of the Buhl Foundation, Pittsburgh. Messrs. Wright, Kohn, and Ackerman spoke in the morning, pointing out the possibilities of the planner in large-scale housing, and the progress, or lack of it, that is being made in our slow efforts to profit by the R. F. C. credit. Ackerman rather stunned the Conference with some graphs for the period from 1800 to 1950, showing the following curves: population, which has increased with the square of the time; production, which has increased with the third power of the time; debt, which has increased with the fourth power of the time; energy consumed, which has in-

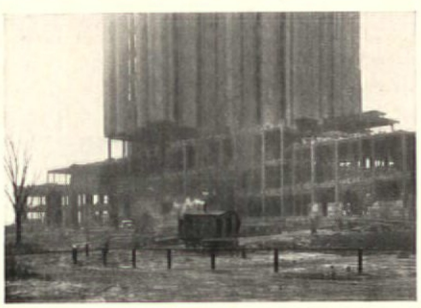
creased with the eighth power of the time; and, finally, the man-hours per unit produced, which has decreased with the fourth power of the time. Ackerman




had nothing to plead, nothing to argue, merely laying before us these startling facts, some of the significance of which it would seem we should have long ago noted and by them set our course.

The Conference proceeded through a luncheon, an afternoon session, and an evening session, the interesting details of which are far too many and varied to be set down in these short notes.

*Tuesday, November 15.*—Between the breakfast round-table on zoning and the beginning of the morning session, I wandered over to see "The Learning Tower of Pizaburgh," Charles Klauder's dominant for the University of Pittsburgh group. It seems particularly unfortunate, in view of the beauty of this



tower, that the money for completing it has apparently ceased its flow temporarily, so that most of the base is, and perhaps will for some time remain, merely a group of bare steel columns.

Nearby is the new building for Mellon Institute, a classic pile of limestone almost entirely surrounded by huge monolithic columns; these might conceivably shelter an art museum or a sub-treasury, but surely not, without an agile imagination, a laboratory for industrial research. There are almost no windows behind the columns, but I understand that the centre of the block is an open court, and many of the laboratory activities are two or three levels under ground. I can hardly believe that Janssen & Cocken, the architects, would



have expressed in this particular monumental form a laboratory for research, unless perhaps Mr. Mellon, during his residence in Washington, became so impressed with the dignity and importance of the classic column that he felt it would be indispensable.

After another profitable session, the members of the Conference were taken out to see Chatham Village, that notable work in group housing carried out by the Buhl Foundation from the designs of Ingham & Boyd, architects, with Clarence S. Stein and Henry Wright consulting. I was interested to find that the houses are built of brick veneer construction, the architects believing that a brick veneer backed by asphalt-impregnated felt on a wood frame, with the plaster on a backed metal lath inside, would produce a wall tighter against moisture and air penetration than eight inches of brickwork. The houses, which are built in groups, having two to six in each, sometimes with an integral garage, others with a garage in a nearby compound, rent for from fifty-four to seventy-nine dollars a month. In some cases the dining-room is separate; in others, an end of the living-room is used for the dining-table; and still others, a dinette between living-room and kitchen. The plans are extremely compact, the buildings well executed, and they are finished with an unusual provision against the necessity for more than a minimum of maintenance costs.

After the evening banquet I had to hurry back to New York, with the more regret in that on the following day some of the Conference members were journeying to Cleveland to look over the new experimental steel house at Solon.

*Thursday, November 17.*—To a luncheon meeting of the New York Chapter, A. I. A., at which President Ernest Russell greeted the members.

With Chester Aldrich back to his office to see what his firm is doing in an unusual architectural activity—making doll houses for Macy's store to sell. The work is being done by some of the firm's draftsmen who have been recalled from unemployment for that purpose.

*Saturday, November 19.*—Sydney E. Martin in from Philadelphia, telling me of the great work that has recently been finished in certain activities of the Philadelphia Chapter. As part of the plan to provide work for the unemployed draftsmen, the Chapter formed a committee to survey what is known as the Old City—an area which lies between the Delaware River on the east, Ninth Street on the west, Spring Garden Street on the north, and Washington Avenue on the south. Various architects were made responsible for certain parts of this area, their duties being to seek out any work still existing from the eighteenth century and early nineteenth, measure it, and by drawings and photographs put it into a permament record. It is gratifying to find that there are one or two whole blocks, with narrow streets, on both sides of which these early brick houses, huddled closely together, still stand. What a marvellous opportunity for Philadelphia to reclaim this old city, much of which is coming under the blight of deterioration and desertion!

*Tuesday, November 22.*—I am sorry to see that the government of Anhalt has closed Gropius' Bauhaus. It was an instructive experiment. The National Socialists have not only closed the Bauhaus, but have voted to pull down the building, which destruction, however, is postponed for lack of funds. The history of the Bauhaus, which was founded in 1920, in Weimar, is interrupted by this decree. The citizens of Weimar were unsympathetic with the experiment of Gropius and his students, regarding them as a profanation of their classic traditions. In 1925, the Bauhaus left Goethe's city, and the government of Anhalt and the town of Dessau placed a new site at its disposal. (Milton Lowenstein contributed an article on the Bauhaus in ARCHITECTURE for July, 1929.) After Gropius conferred the directorship upon the architect, Hannes Meyer, the institution became involved in political wrangles. Mies van der Rohe became the new director, and now I hear that Berlin is offering the Bauhaus a new home.

*Saturday, November 26.*—I'm wondering whether there isn't the beginning of a rather spirited discussion in the fact that students in the Department of Architecture at Yale participated in a competition for a new chapel in Park Cemetery, Bridgeport. The winning design is the work of Charles M. Brooks, Jr., a graduate student. Some one will be rising up to say that bread is being taken from the practitioner's mouth not only by the Small House Service Bureau, but now also by the educational institutions.

CONTACTS

DEVOTED TO A BETTER UNDERSTANDING OF THE BUSINESS SIDE OF ARCHITECTURE AND ITS RELATION TO THE INDUSTRIES

# The Minimum House

*By Ernest M. Fisher*

Professor of Real Estate, University of Michigan

THE question of determining what to build must be answered in the light of what families can afford to pay for housing facilities. This principle applies with double force to the question of the type of structure which should be erected to replace the unsatisfactory houses in slum, congested, and blighted areas. But as a matter of fact, in actual practice the question of what to build is approached from an almost opposite point of view, adopting certain specifications covering facilities, layout, and equipment, regardless of the influence of these specifications upon cost. The first step in any programme should be the determination of the amount which families are willing and accustomed to pay for housing. Within the limitations set by the answer to this inquiry, the effort should be made to provide as many facilities, conveniences, and luxuries as possible.

In most cases it will probably be found that only the bare minimum of facilities can be provided within the limitations of customary rentals. In the lower-income groups, family incomes probably do not average more than $1500 to $1800 annually. Their rents should not exceed $25 to $35 a month. For this modest return, only bare facilities, the minimum house, can be provided.

Living, as the majority of these families are, in houses that fail to provide even the essentials of health, safety, and some degree of privacy, they are not demanding tile bathrooms, electric refrigeration, and the latest frills and fancies.

Specifically, a minimum house would provide running water, with private toilet and sink in every family unit. Some sort of bathing facilities should also be provided, but it is very questionable whether installation of a bathtub would be found essential. While hot water is a convenience in domestic operations, it is by no means essential to healthful existence provided arrangements are at hand for the heating of a sufficient quantity of water in case of need. Likewise, the provision of central heating facilities is a great convenience, but is by no means essential to healthful and comfortable existence. A combination heating stove and kitchen range is widely used in England and some other European countries and is accepted as standard equipment. Electricity as a lighting device has become essential, but the appliances which go with electricity are still for the most part conveniences if not luxuries.

It will be at once objected that the provision of the minimum house would be an absurd and disastrous experiment because the house when completed would be obsolete. This argument is based upon a false premise. Instead of being an argument against the minimum house it is one of the strongest arguments that could be presented for it. The rapidity with which obsolescence occurs in any commodity is in direct proportion to the degree of luxury which it embodies. Those whose income makes their budget of expenditures rigid necessarily pay little attention to fashion. The minimum house would offer, therefore, the essentials of housing to the lower-income groups, as long as it stood. A proper policy of maintenance and repairs would for a great many decades defeat depreciation. The capital invested in a minimum house therefore has the capacity of producing an income for a much longer period of time than that which is invested in the house that provides more by way of luxury. Instead of a life span of thirty years, it would probably have one of between seventy-five and one hundred.

It would be absurd to expect that the minimum house would be produced by speculative capital seeking large returns. When it is provided it must be produced by capital seeking permanent investment at a fair rate of return. Direct operation will also eliminate the speculative profits which are secured by speculative capital building for a sales market in the hope of a quick turnover. It must be recognized that the provision of housing facilities, especially for the lower-income groups, is a capitalistic enterprise in which the capital investment is permanent.

This plea for the minimum house must be taken not as a pessimistic statement but as originating in the desire for a frank facing of facts. There is no magic by which a standard which can be maintained by income can be created, and certainly there is nothing to be gained by ignoring the direct relationship between income levels and housing standards. Income levels for the majority of families living in congested areas of our large cities are not sufficiently high to enable these families to command those conveniences and luxuries which are provided in all the new construction that is taking place. New construction should be planned definitely to meet the needs of these groups.

## Comparative Costs

AN unusually comprehensive table of costs, figured on the cubic-foot basis, will be found on the next page. All rule-of-thumb cost tables must necessarily be taken as general guides rather than as specific figures. Costs vary with the locality, with the season, with the size of the work, with the existing eagerness of contractors for work. The table reproduced on the following page is a compilation of the Detroit Real Estate Board, its figures applicable to Detroit, but, as is somewhat unusual, showing the variations of those figures over a period of sixteen years, and for a wide variety of buildings. Its primary purpose is to serve as a check on appraisals.

## COST PER CUBIC FOOT IN CENTS

(Copyright, 1932 by Detroit Real Estate Board)

| Classification of Buildings | Aug., 1915 | Aug., 1920 | Jan. 1, 1921 | Aug. 1, 1921 | April 1, 1922 | Dec. 1, 1922 | Jan. 1, 1924 | Feb. 1, 1925 | Feb. 1, 1926 | Feb. 1, 1927 | Jan. 1, 1928 | Jan. 1, 1929 | Jan. 1, 1930 | Jan. 1, 1931 | Jan. 1, 1932 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Factories and Warehouses: | | | | | | | | | | | | | | | |
| Fireproof (Under 300,000 cu. ft.) | .14 | .31½ | .23 | .18 | .17 | .21½ | .24 | .23 | .22½ | .23 | .22 | .22 | .22 | .16½ | .15 |
| Fireproof (Over 300,000 cu. ft.). | .12½ | .29 | .21 | .17 | .16 | .19½ | .23 | .22 | .21½ | .22 | .21 | .21 | .21 | .16 | .14½ |
| Mill Construction | .10 | .22½ | .15½ | .12 | .11 | .14 | .16½ | .16 | .16 | .16½ | .15¾ | .15¾ | .15½ | .11½ | .11 |
| Ordinary | .09 | .21 | .15 | .12 | .10½ | .13½ | .15 | .14½ | .14 | .14½ | .14 | .14 | .13½ | .10 | .09½ |
| Frame | .07½ | .17 | .12 | .10 | .08 | .11½ | .13 | .11 | .10½ | .10½ | .10 | .10 | .10 | .07½ | .07 |
| Stores: | | | | | | | | | | | | | | | |
| Fireproof | .23 | .52 | .39 | .31 | .30 | .36 | .41½ | .40 | .39 | .39½ | .38 | .38 | .38½ | .30 | .29½ |
| Ordinary | .16½ | .37½ | 26½ | .21 | .19 | .24½ | .28 | .26½ | .26 | .26½ | .25½ | .25½ | .25 | .20 | .19 |
| Flats (Above Ordinary) | .22 | .48½ | .34 | .27 | .23 | .30½ | .31 | .29 | .28 | .28½ | .27½ | .27½ | .27 | .22 | .21 |
| Ordinary without Basements | ..... | ..... | ..... | .16¾ | .16 | .18½ | .21 | .19 | .18 | .18 | .17½ | .17½ | .17 | .14¼ | .14 |
| Churches and Theaters: | | | | | | | | | | | | | | | |
| Fireproof | .18 | .40½ | .35 | .28 | .27 | .32½ | .37½ | .36 | .35¼ | .36 | .34¾ | .34¾ | .35 | .27 | .26 |
| Ordinary | .15½ | .35 | .24½ | .19 | .18 | .22 | .28½ | .27½ | .27 | .27½ | .26½ | .26½ | .26 | .20½ | .19½ |
| Office Buildings: | | | | | | | | | | | | | | | |
| Fireproof | .30½ | .68½ | .54½ | .44 | .35 | .51 | .54½ | .52 | .51 | .51½ | .49¾ | .49¾ | .50 | .39 | .37½ |
| Ordinary | .22 | .48½ | .34 | .27 | .25 | .30½ | .35 | .33½ | .32¾ | .33¼ | .32 | 32 | .32 | .25 | .24 |
| Hotels: | | | | | | | | | | | | | | | |
| Fireproof | .33½ | .75½ | 58½ | .45 | .37 | .52 | .59½ | .57 | .56 | .57½ | .55½ | .55½ | .56 | .42¾ | .42 |
| Ordinary | .29½ | .66½ | .46½ | .37 | .26 | .43 | .43 | .34 | .32 | .32½ | .31¼ | .31¼ | .31 | 25½ | .24 |
| Schools: | | | | | | | | | | | | | | | |
| Fireproof | .22 | .48½ | .40½ | 32 | .30 | .37 | .45½ | .43½ | .42 | .43¼ | .40 | .40 | .40 | .32 | .30 |
| Hospitals: | | | | | | | | | | | | | | | |
| Fireproof | .32 | .72 | .54 | .32 | .33 | .37 | .45½ | .43½ | .42 | .43¼ | .45 | .45 | .45 | .32 | .32 |
| All Steel Buildings: | | | | | | | | | | | | | | | |
| Under 20,000 cu. ft. | .12 | .25 | .21 | .17 | .15 | .19½ | .20 | .14 | .13½ | .13½ | .13 | .13 | .13 | .11 | .11 |
| 20,000 to 100,000 cu. ft. | .08 | .18 | .15 | .12 | .10 | .14 | .14½ | .12 | .11 | .11 | .10½ | .10½ | .10½ | .10 | .10 |
| Over 100,000 cu. ft. | .06½ | .14 | .13 | .10 | .08 | .11½ | .11½ | .10 | .09½ | .09½ | .09 | .09 | .09 | .07 | .07 |
| Apartments: | | | | | | | | | | | | | | | |
| Fireproof | .35 | .78 | .54 | .43 | .36 | .50 | .55 | .52½ | .51 | .52 | .50 | .50 | .50 | .39 | .37½ |
| Protected | .29½ | .66½ | 46½ | .37 | .30 | .43 | .48 | .46 | .45½ | .46 | .44¼ | .44¼ | .45 | .34½ | .34 |
| Brick (Ordinary) | .28 | .63 | .43 | .34 | .23½ | .39½ | .34 | .32 | .30 | .30½ | .29½ | .29½ | .29 | .24 | .23 |
| Brick (Veneer) | .24 | .54 | .37 | .30 | .22 | .34½ | .32 | .30 | .29 | .29 | .28 | .28 | .28 | .22½ | .22 |
| Residences: | | | | | | | | | | | | | | | |
| Brick | .30½ | .68½ | .48 | .38 | .33 | .45 | .48 | .46 | .45 | .45½ | .44 | 44 | .44½ | .34½ | .33½ |
| Brick (Veneer and Stucco) | .24 | .54 | .37 | .30 | .24 | .34½ | .34 | .32½ | .32 | .32 | .30¾ | .30¾ | .30½ | .24 | .23 |
| Frame | .21½ | .48½ | .34 | .27 | .19 | .30½ | .30 | .26½ | .25 | .25 | .24 | .24 | .24 | .20 | .19 |
| Frame (Not over 25,000 cu. ft.) | .... | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .20 | 20 | .20 | .20 | .15 | .15 |
| Cinder Concrete Block | .... | .... | ..... | ..... | ..... | ..... | .41½ | .39 | .38 | .38 | .36¾ | .36¾ | .37 | .29 | .28 |
| Garages: | | | | | | | | | | | | | | | |
| Fireproof | ..... | .30 | .23 | .18 | .17 | .21 | .24 | .23 | .22½ | .23 | .22¼ | .22¼ | .23 | .17 | .17 |
| Mill Construction | ..... | .20 | .15 | .12 | .11 | .14 | .16 | .15 | .14 | .14½ | .14 | .14 | .13½ | .11 | .11 |
| Ordinary | ..... | .17 | .14 | .11 | .10 | .13 | .15 | .13½ | .12½ | .13 | .13 | .13 | .13 | .10 | .10 |
| Frame | ..... | .14 | .12 | .09 | .08 | .10½ | .12 | .10 | .09½ | .09½ | .09 | .09 | .09 | .08 | .07 |
| Sheds Without Heat: | | | | | | | | | | | | | | | |
| Enclosed Without Floor (Frame) | | | | | | | | | | | | | | .04¾ | 04½ |
| Enclosed (Frame) | | | | | | | | | | | | | | .06 | .06 |
| Enclosed (Ordinary Construction) | | | | | | | | | | | | | | .09½ | .09¼ |
| Enclosed Without Floor (Ordinary Construction) | | | | | | | | | | | | | | .09¼ | .09 |
| Enclosed (All Steel) | | | | | | | | | | | | | | .04½ | .04½ |
| Enclosed Without Floor (All Steel) | | | | | | | | | | | | | | .03½ | .03½ |
| Open Shelter (Frame Construction) | | | | | | | | | | | | | | .03 | .03 |

1926
DORMER WINDOWS
SHUTTERS AND BLINDS

1927
ENGLISH PANELLING
GEORGIAN STAIRWAYS
STONE MASONRY TEXTURES
ENGLISH CHIMNEYS
FANLIGHTS AND OVERDOORS
TEXTURES OF BRICKWORK
IRON RAILINGS
DOOR HARDWARE
PALLADIAN MOTIVES
GABLE ENDS
COLONIAL TOP-RAILINGS
CIRCULAR AND OVAL WINDOWS

1928
BUILT-IN BOOKCASES
CHIMNEY TOPS
DOOR HOODS
BAY WINDOWS
CUPOLAS
GARDEN GATES
STAIR ENDS
BALCONIES
GARDEN WALLS
ARCADES
PLASTER CEILINGS
CORNICES OF WOOD

1929
DOORWAY LIGHTING
ENGLISH FIREPLACES
GATE-POST TOPS
GARDEN STEPS
RAIN LEADER HEADS
GARDEN POOLS
QUOINS
INTERIOR PAVING
BELT COURSES
KEYSTONES
AIDS TO FENESTRATION
BALUSTRADES

1930
SPANDRELS
CHANCEL FURNITURE
BUSINESS BUILDING ENTRANCES
GARDEN SHELTERS
ELEVATOR DOORS
ENTRANCE PORCHES
PATIOS
TREILLAGE
FLAGPOLE HOLDERS
CASEMENT WINDOWS
FENCES OF WOOD
GOTHIC DOORWAYS

1931
BANKING-ROOM CHECK DESKS
SECOND-STORY PORCHES
TOWER CLOCKS
ALTARS
GARAGE DOORS
MAIL-CHUTE BOXES
WEATHER-VANES
BANK ENTRANCES
URNS
WINDOW GRILLES
CHINA CUPBOARDS
PARAPETS

1932
RADIATOR ENCLOSURES
INTERIOR CLOCKS
OUTSIDE STAIRWAYS
LEADED GLASS MEDALLIONS
EXTERIOR DOORS OF WOOD
METAL FENCES
WOOD CEILINGS
MARQUISES
WALL SHEATHING
FRENCH STONEWORK
OVER-MANTEL TREATMENTS

THE SEVENTY–FIFTH IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

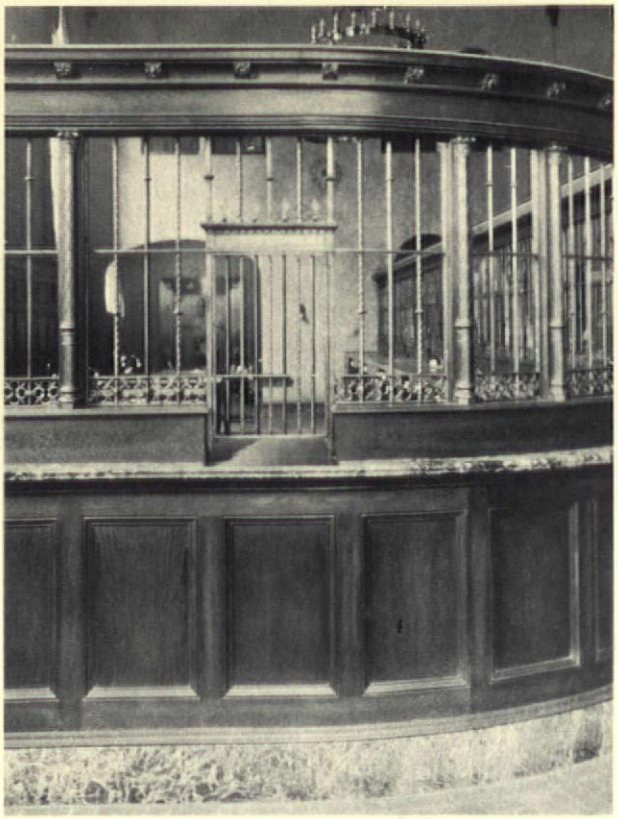
# ARCHITECTURE'S PORTFOLIO OF

# BANK SCREENS



*Subjects of Previous Portfolios Are Listed at Left*

*Forthcoming Portfolios will be devoted to the following subjects: Interior Doors (February), Metal Stair Railings (March), Verandas (April), The Eagle in Sculpture (May), Eaves Returns on Masonry Gables (June), and Exterior Lettering (July). Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up about six weeks in advance of publication date.*

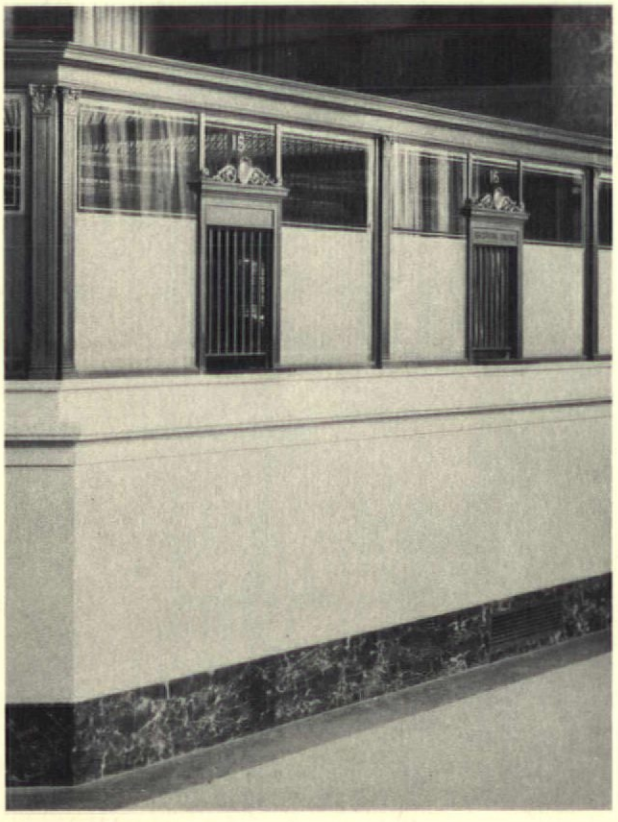


*Charles F. Cellarius; Samuel Yellin*



*Louis E. Jallade*

*C. P. H. Gilbert*

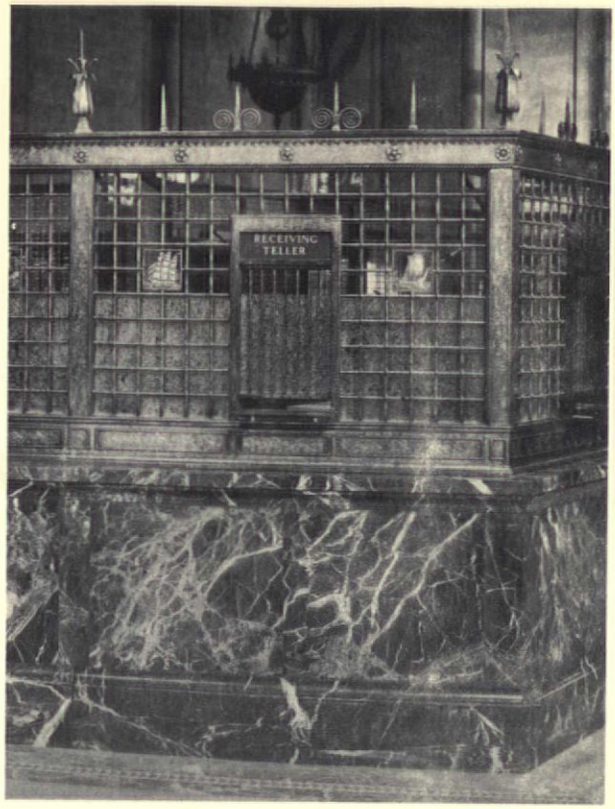


*Allen & Collens*



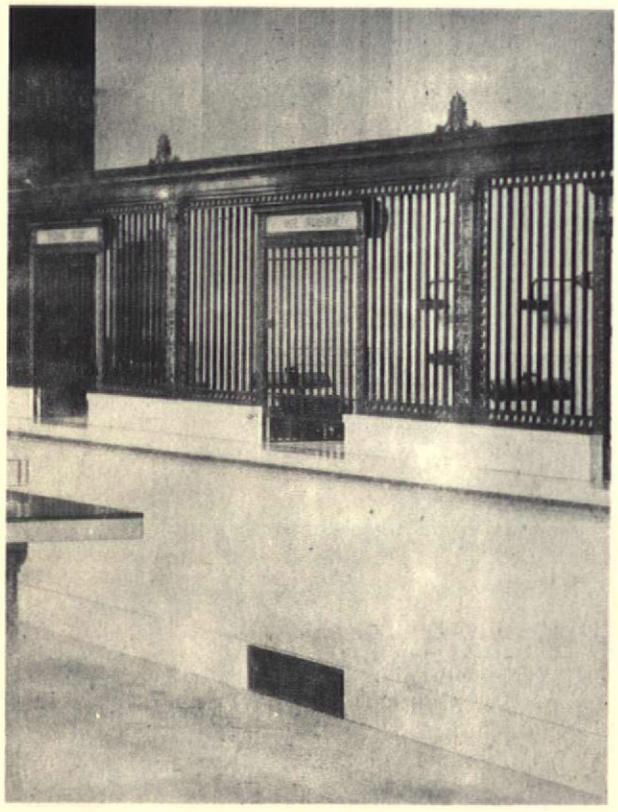


*Albert Kahn, Inc.*

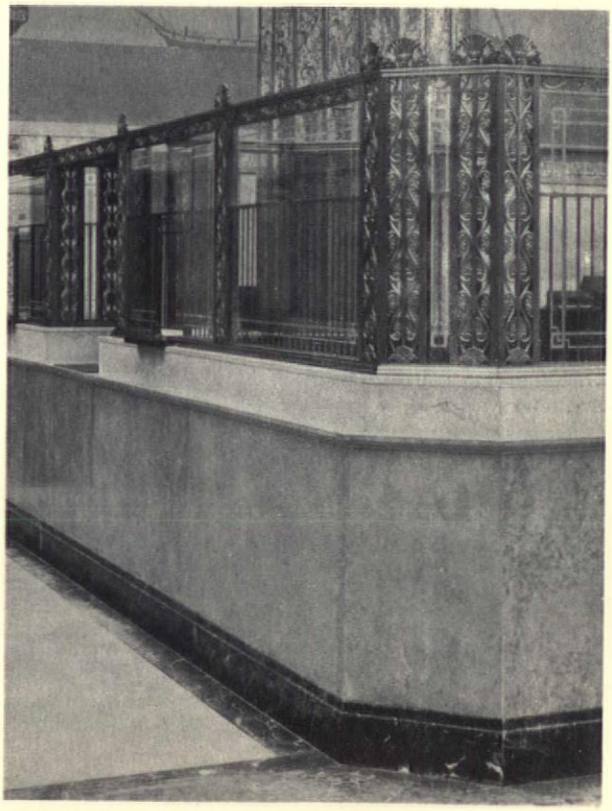


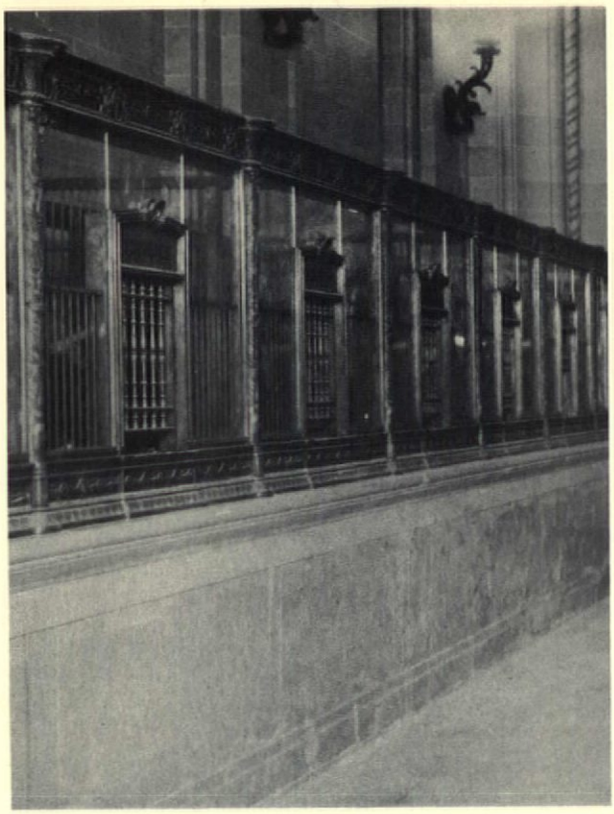

*Benjamin W. Morris*

*Shepley, Rutan & Coolidge*

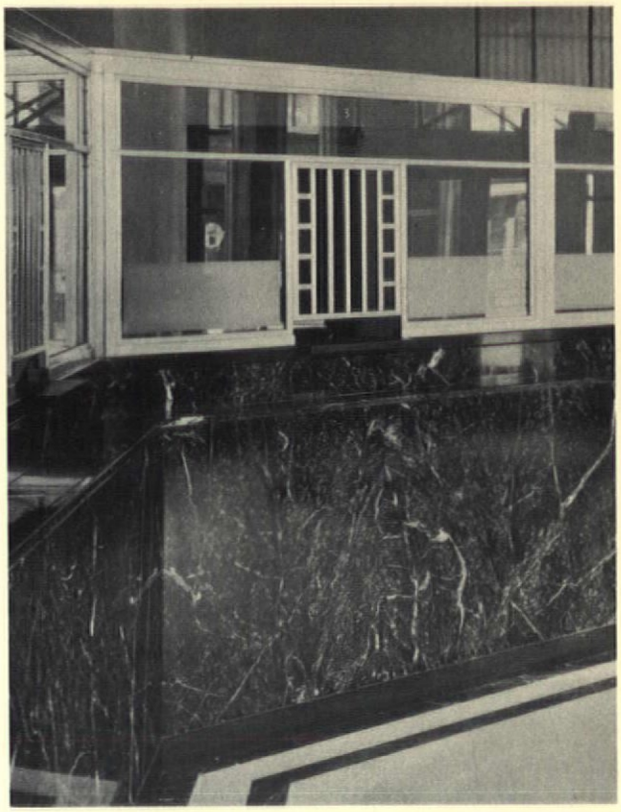


*Cross & Cross*



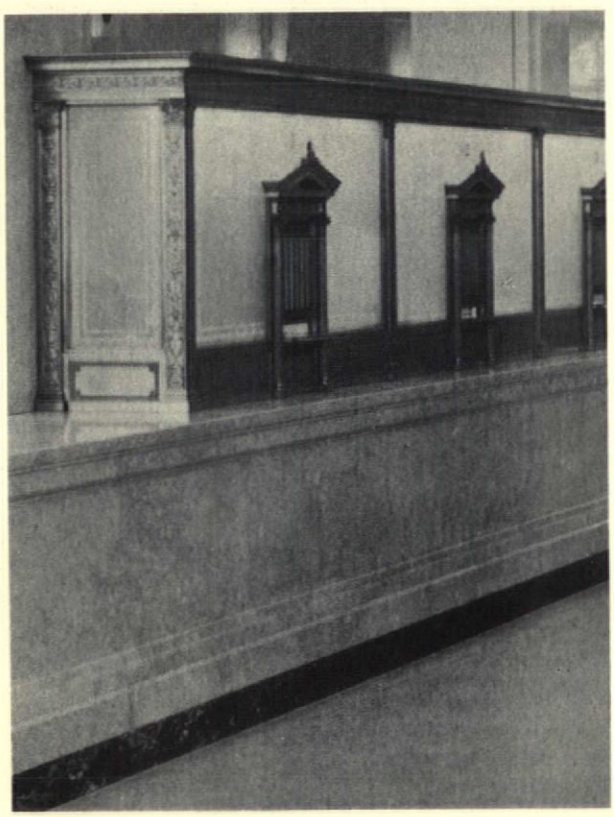


*Walker & Weeks*

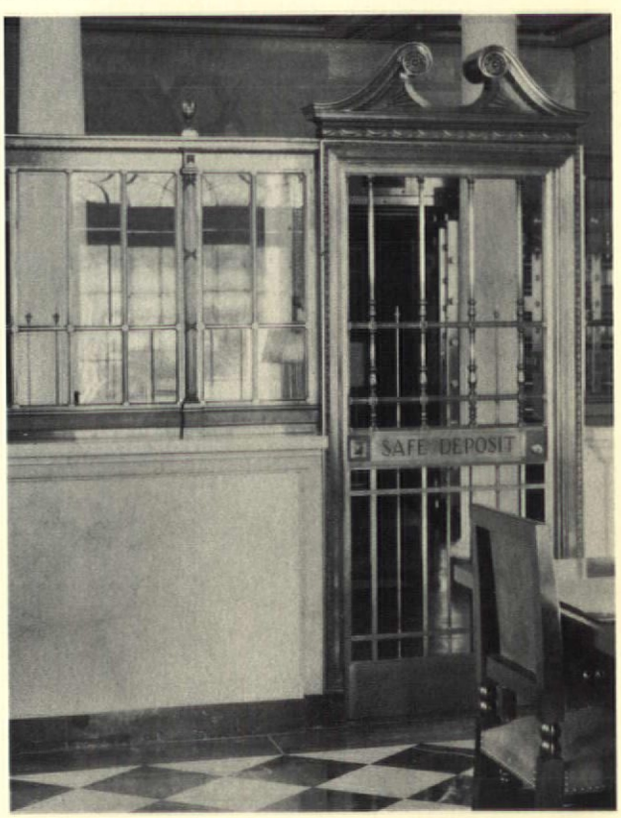


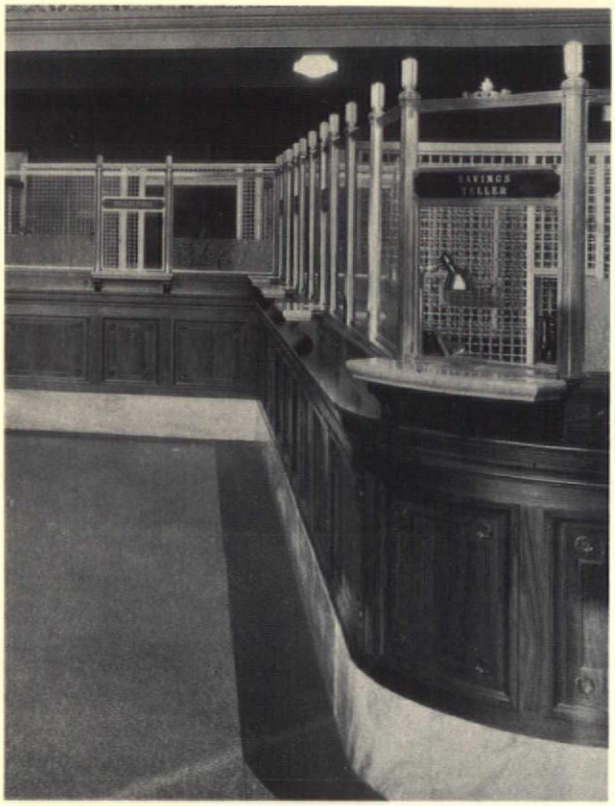
*Smith, Hinchman & Grylls*

*Renwick, Aspinwall & Tucker*



*W. F. Brooks*



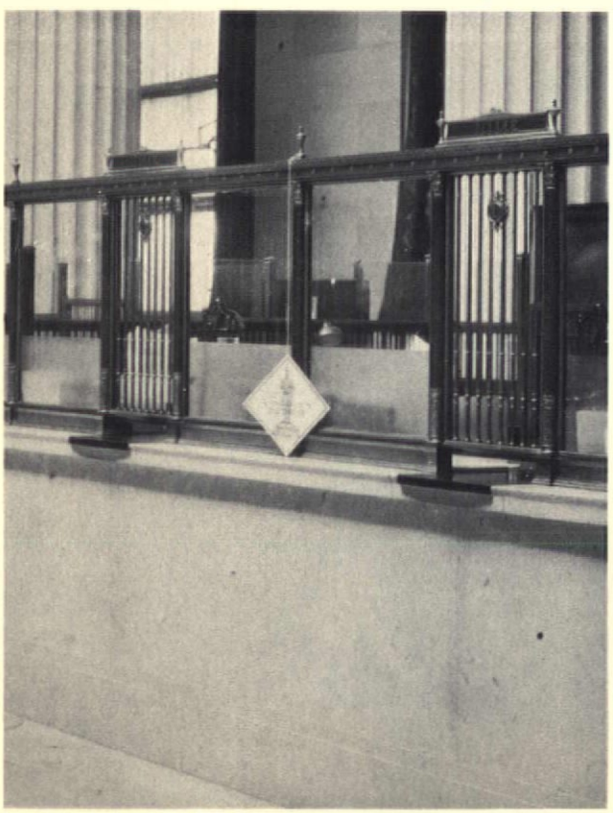


*Bonnah & Chaffee*



*William E. Lehman*

*Weary & Alford*

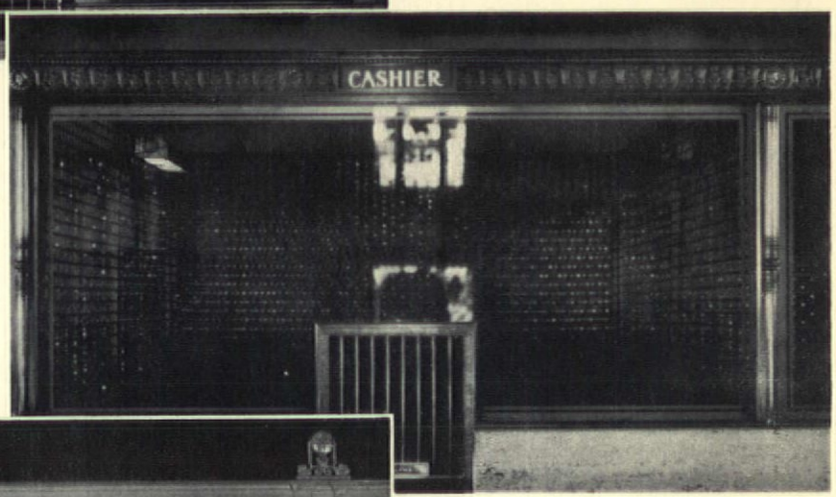


*Smith, Hinchman & Grylls*





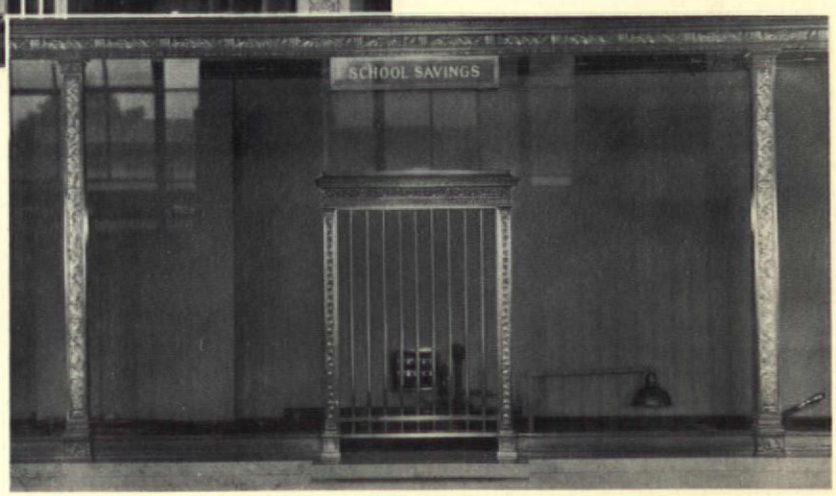

*Alfred Hopkins*




*George D. Mason & Company*

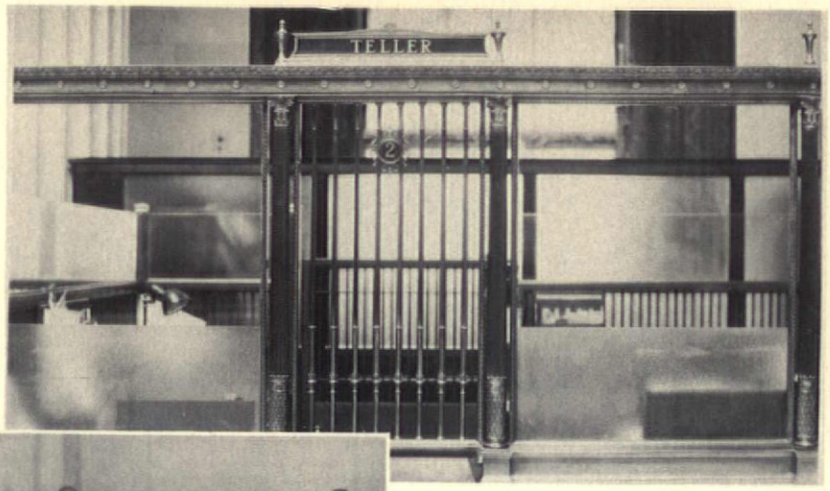


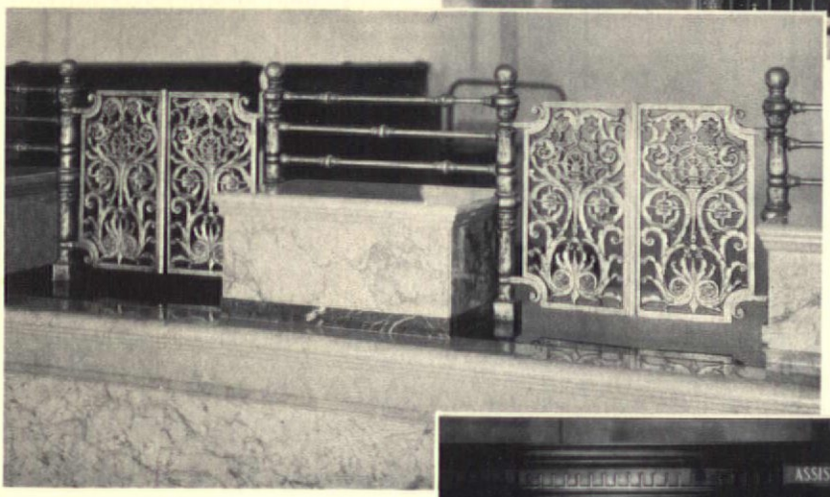

*George E. Jones*



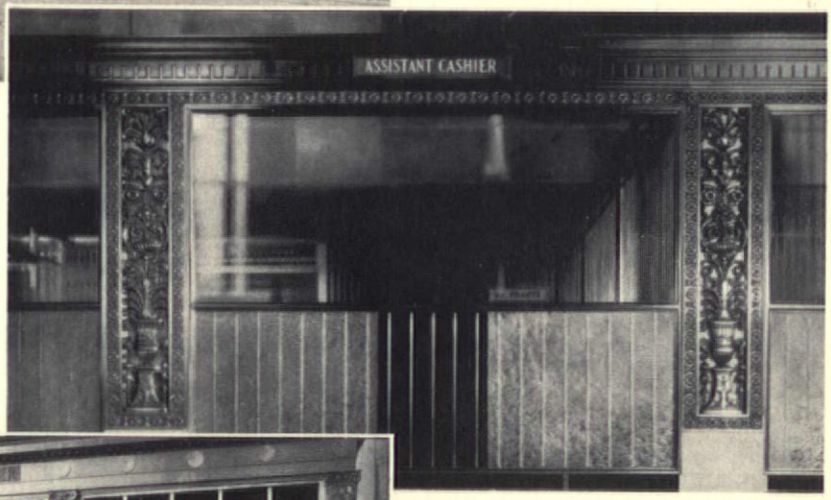

*Purdy & Davis*

*Weary & Alford*

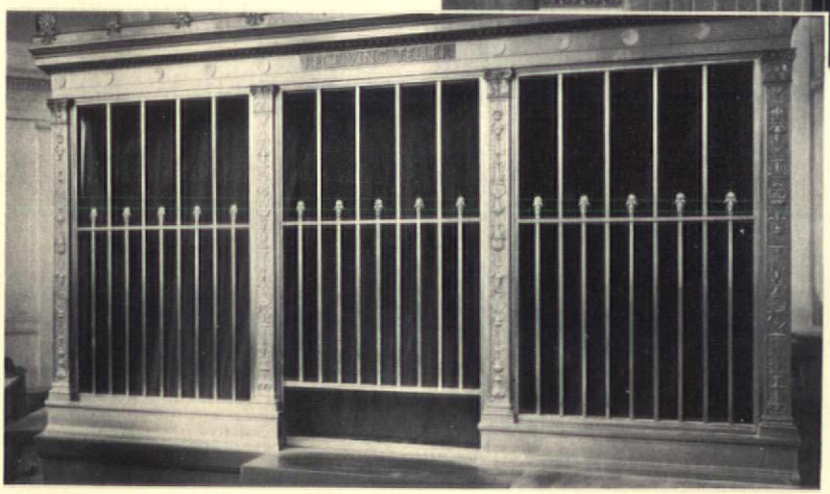


*Morgan, Walls & Clements*



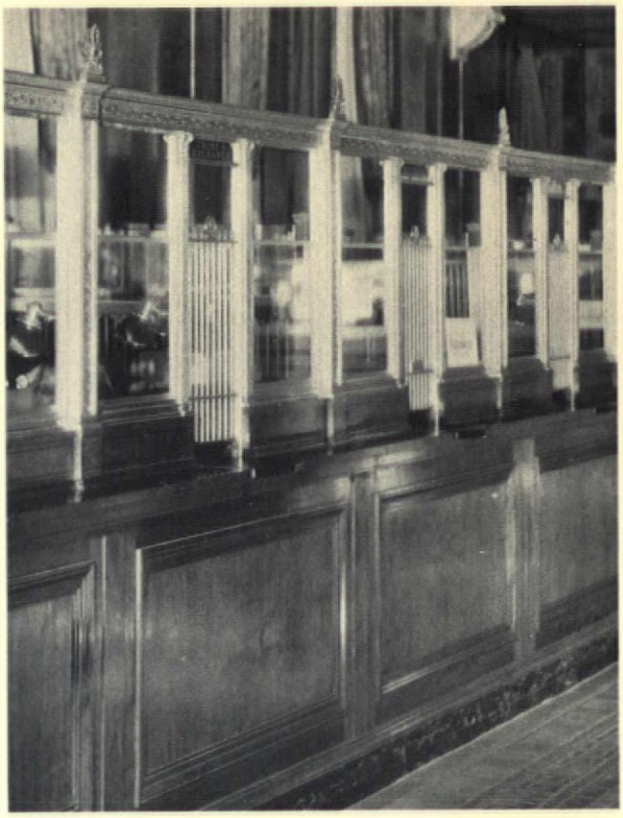

*Ritter & Shay*



*Cass Gilbert*

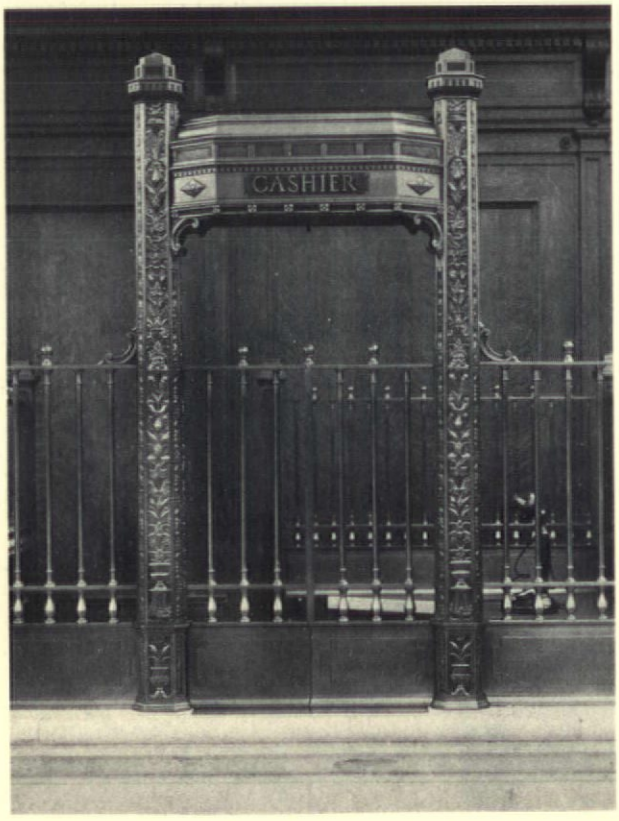


*Albert B. Groves, Inc.*



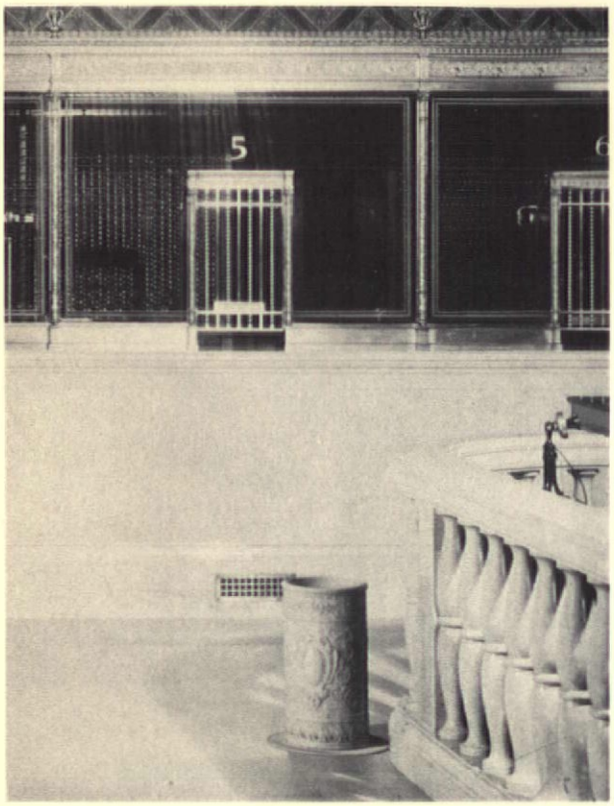
*J. W. Cook Corporation*

*Detail of the above*

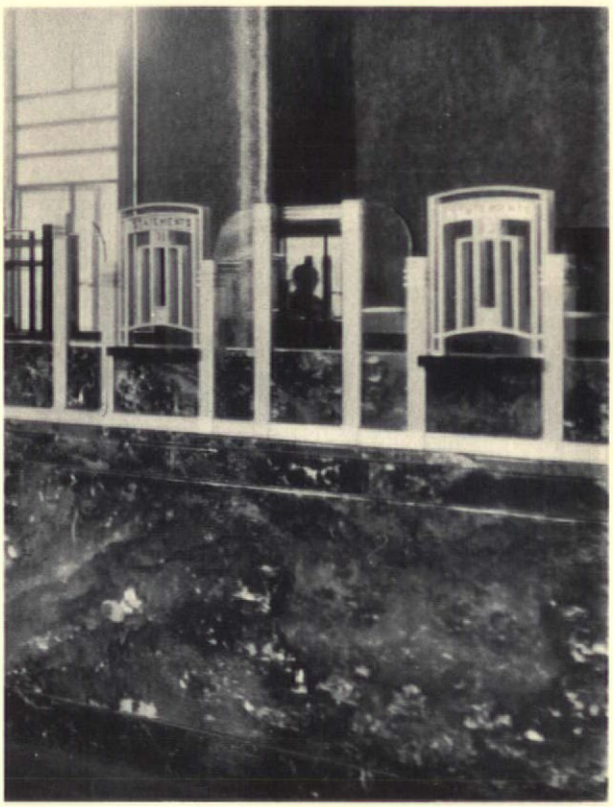



*Detail of the above*



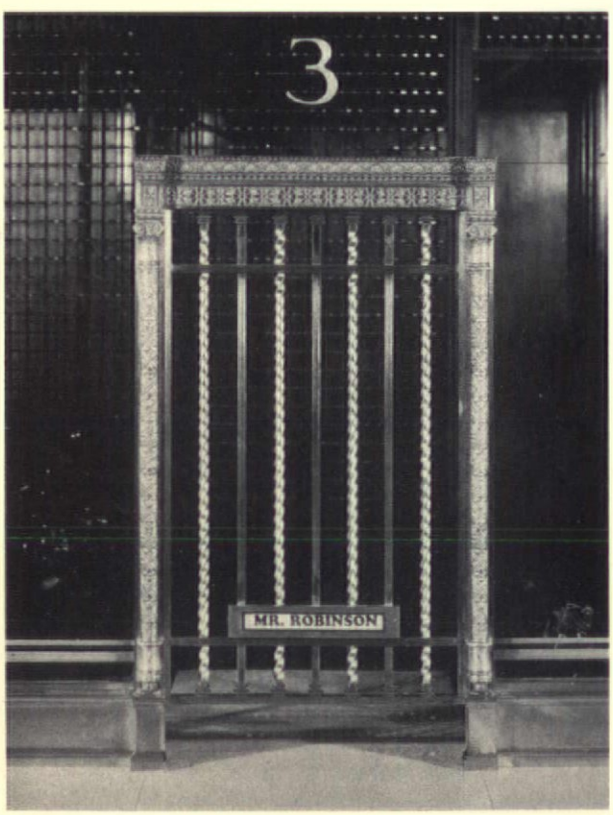



*Albert Kahn, Inc.*

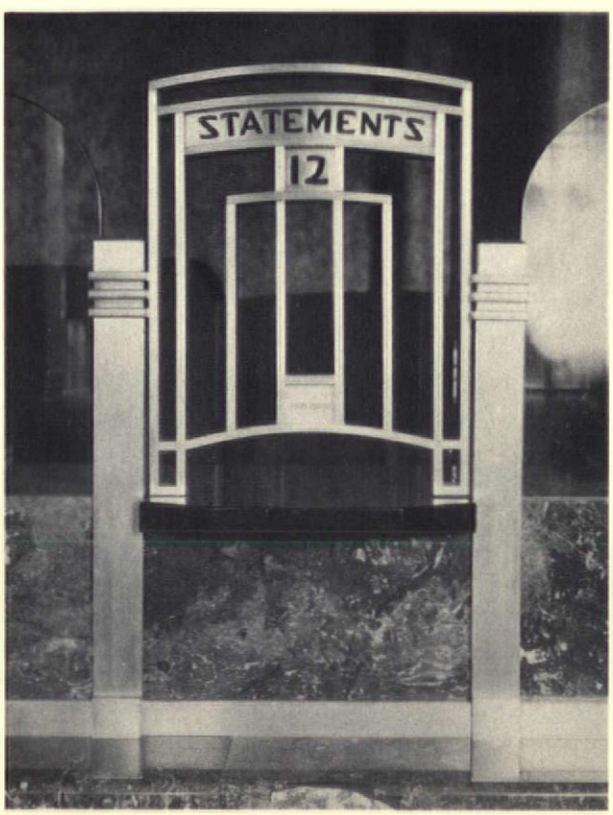


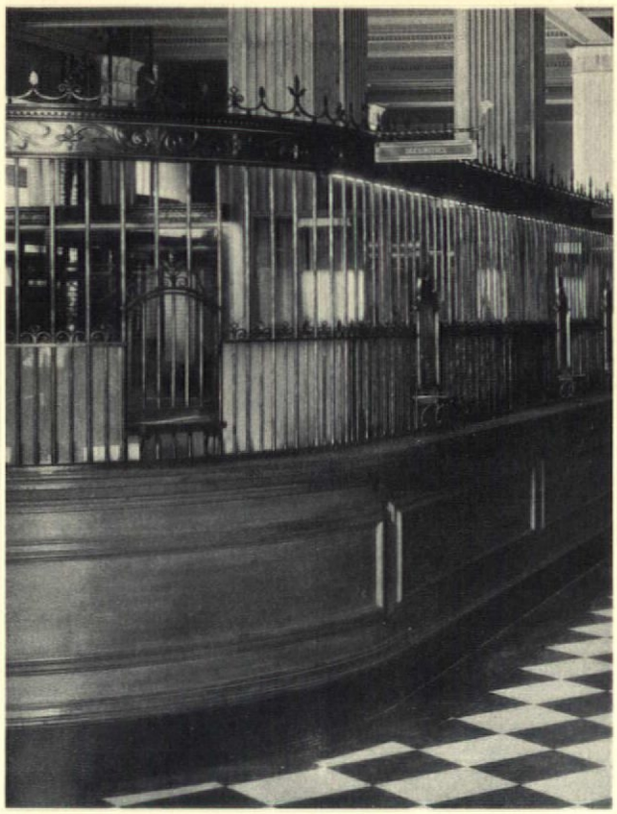
*Alfred C. Finn*

*Detail of the above*

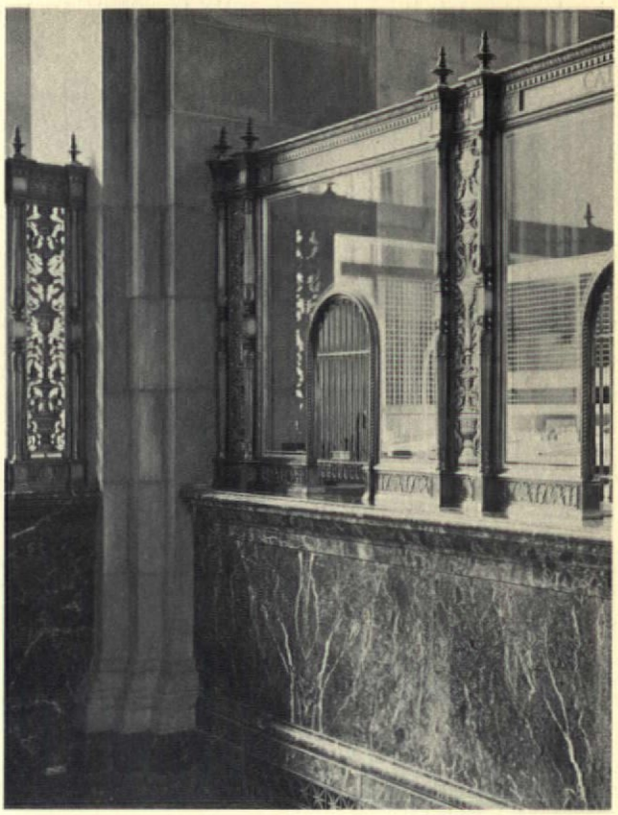



*Detail of the above*



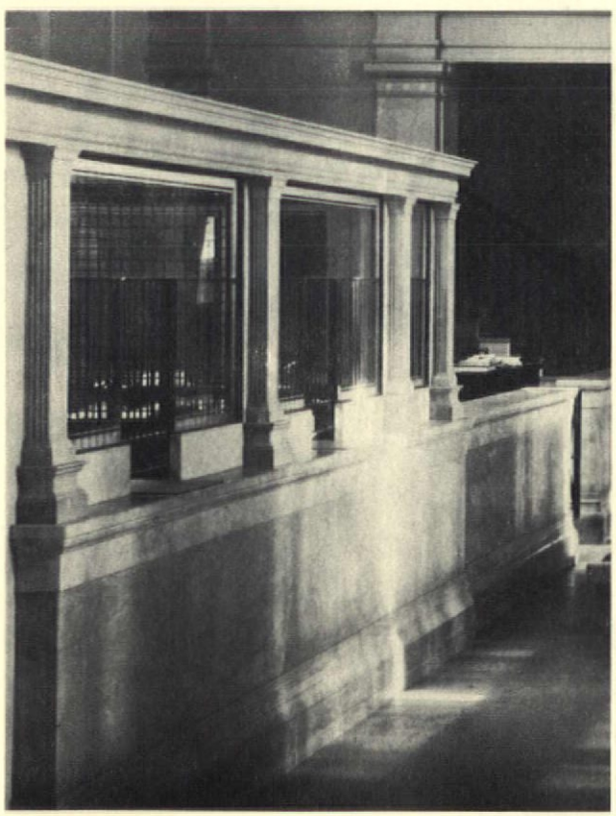


*Peabody, Wilson & Brown*

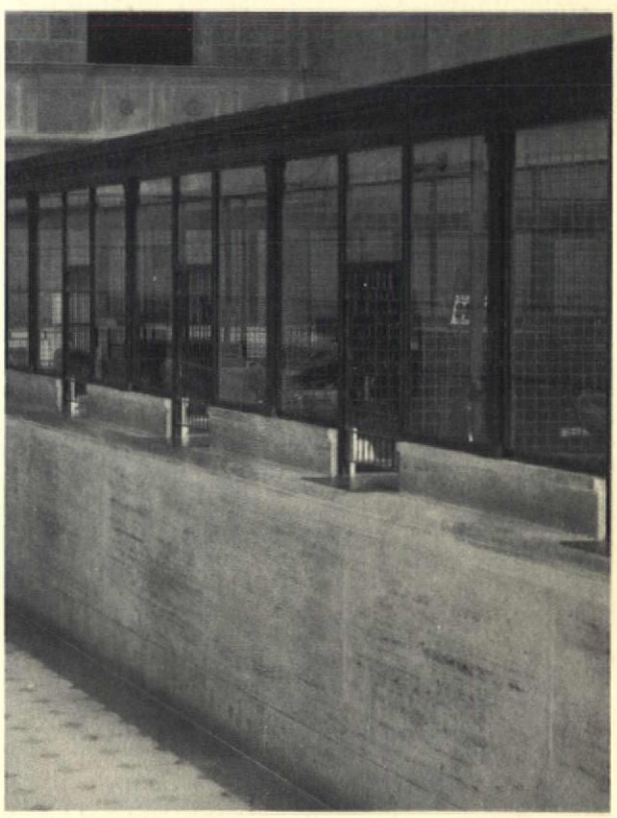


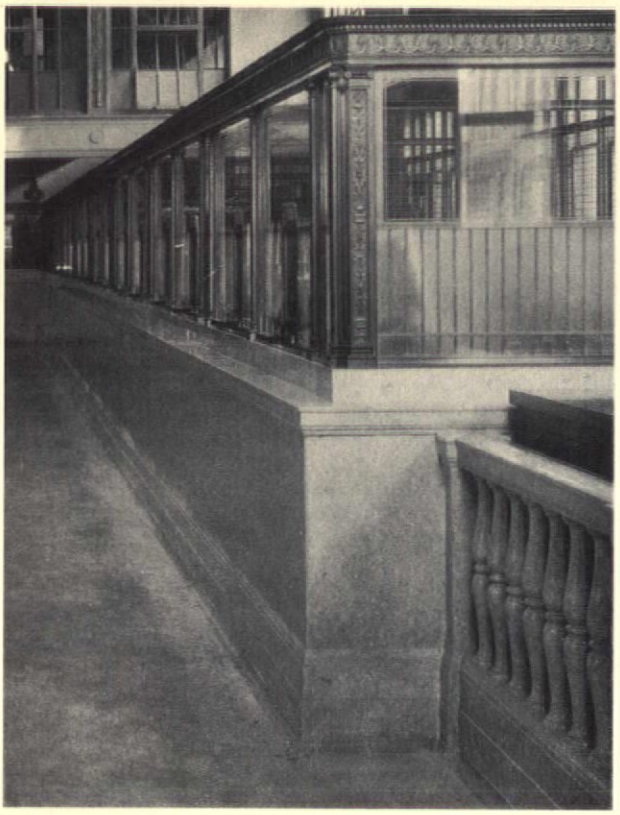
*York & Sawyer*

*Alfred C. Bossom*



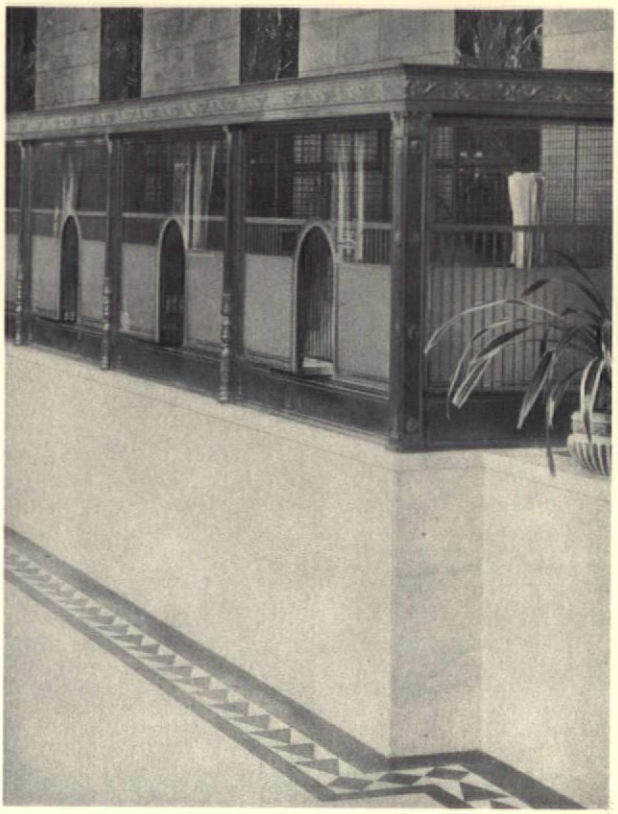
*Paul P. Cret*





*The Mechanics Bank, New Haven, Conn.*

*York & Sawyer*

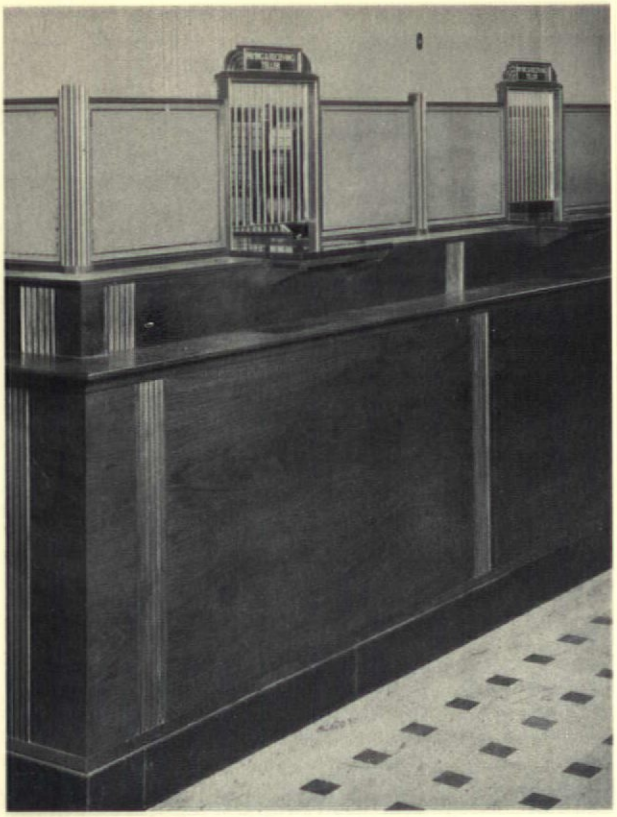


*William E. Lehman*

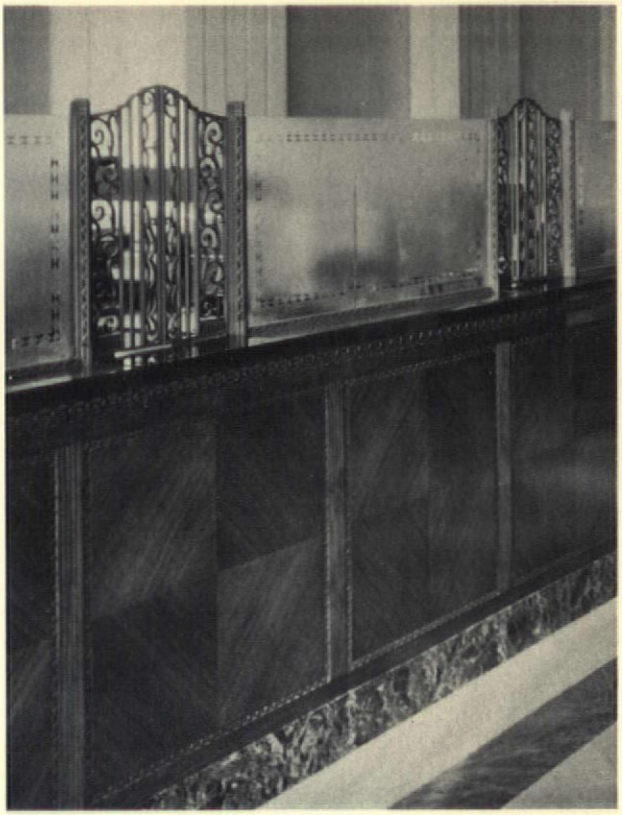
*Rye National Bank, Rye, N. Y.*







*Walker & Gillette*

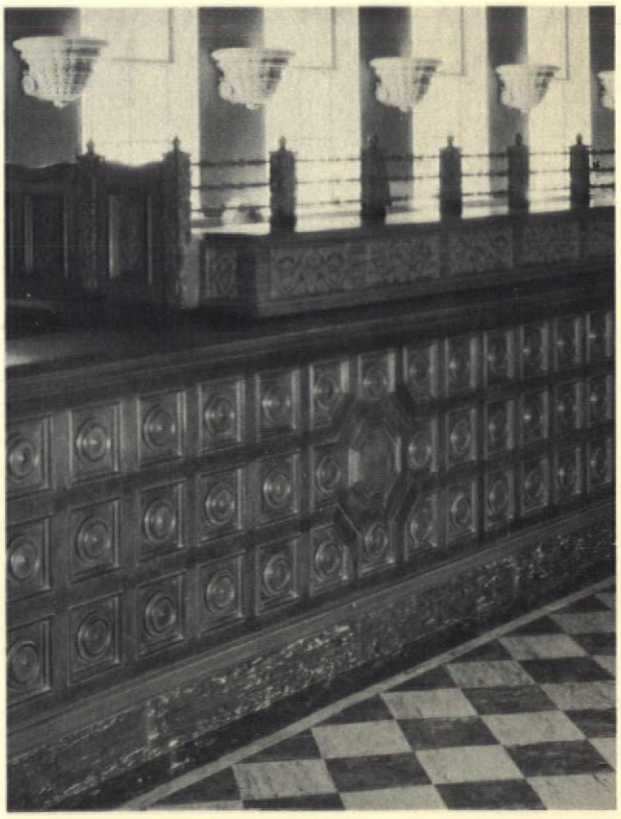


*W. H. Harrison*

*A. Epstein*

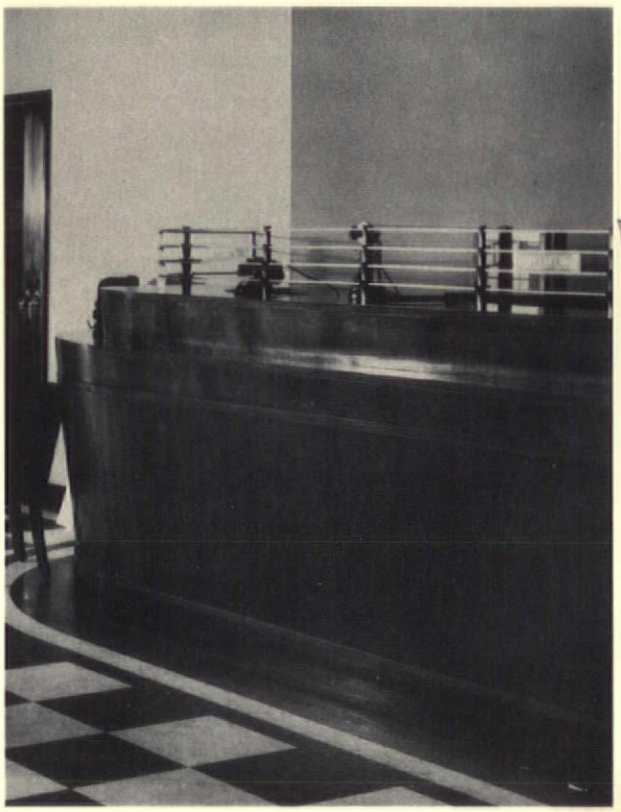


*Morgan, Walls & Clements*



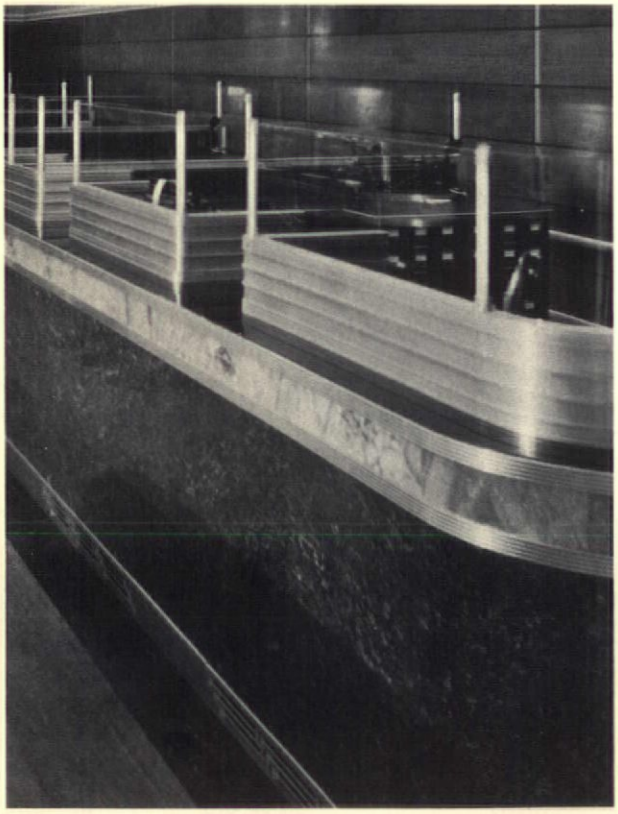


*Morgan, Walls & Clements*



*Corbett, Harrison & MacMurray*

*William Richards*

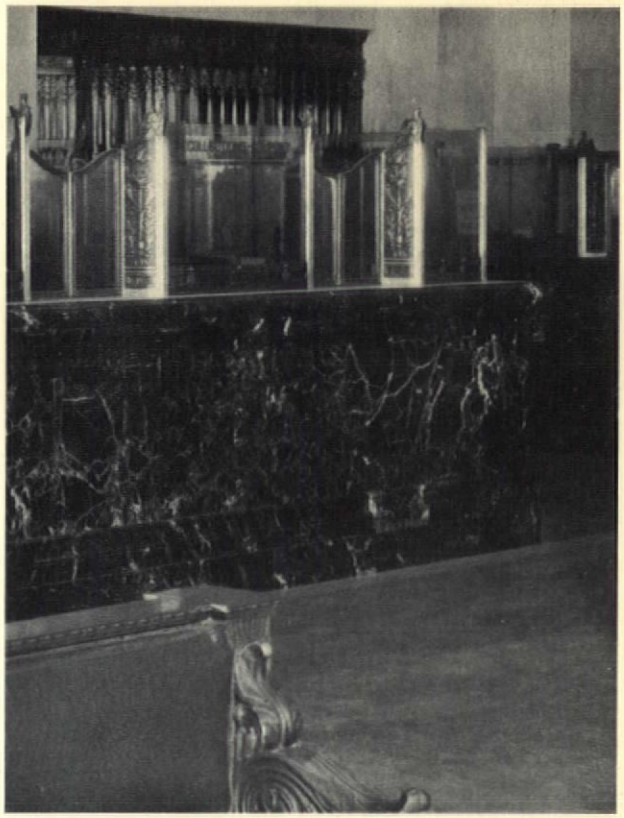


*Morgan, Walls & Clements*



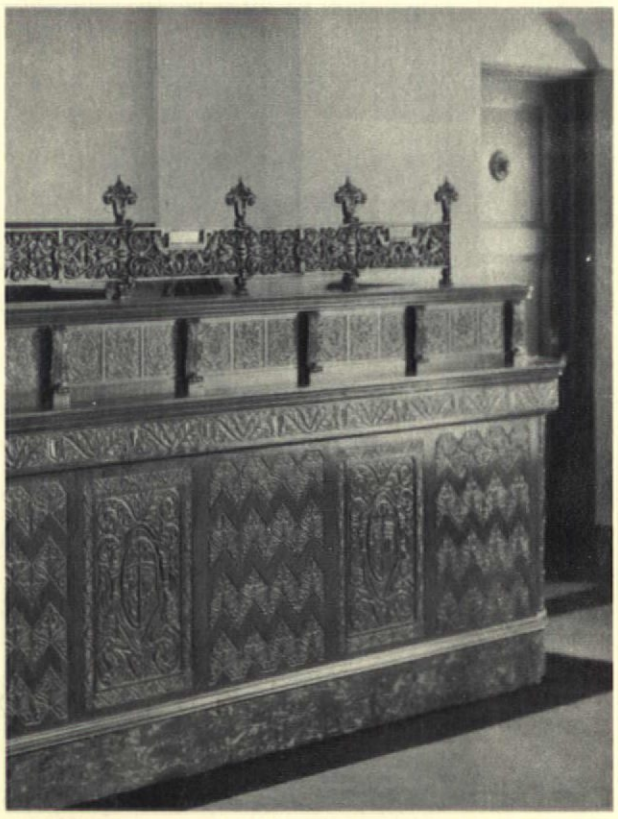


*John Parkinson and Donald B. Parkinson*

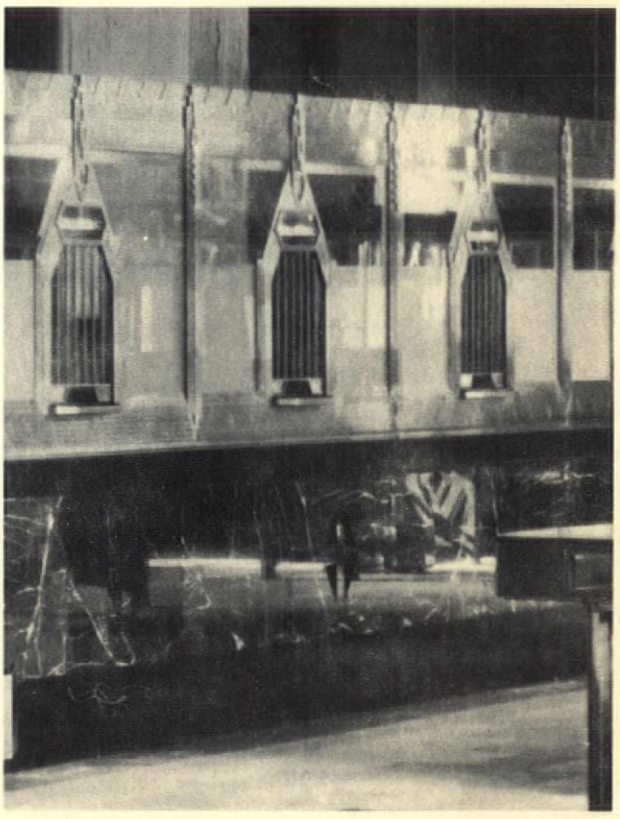


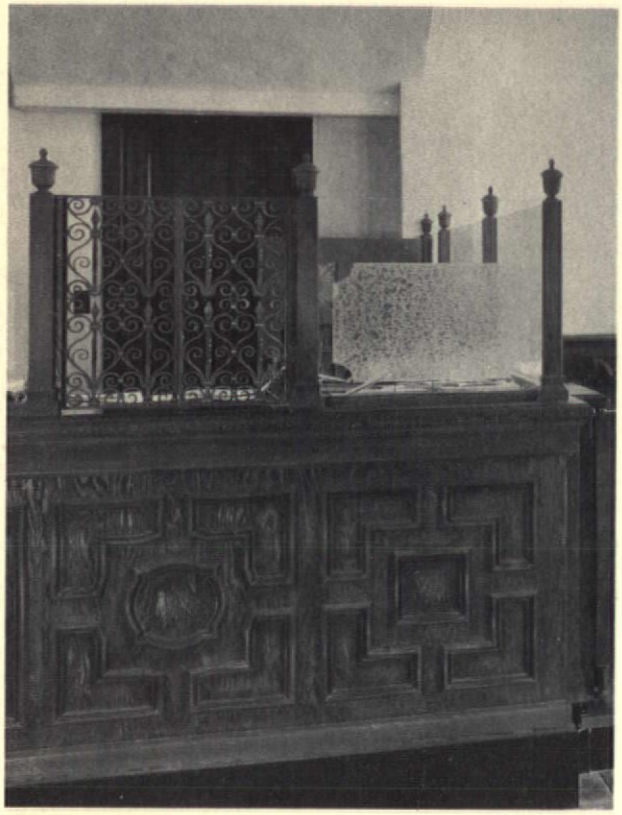
*Walker & Eisen*

*Morgan, Walls & Clements*

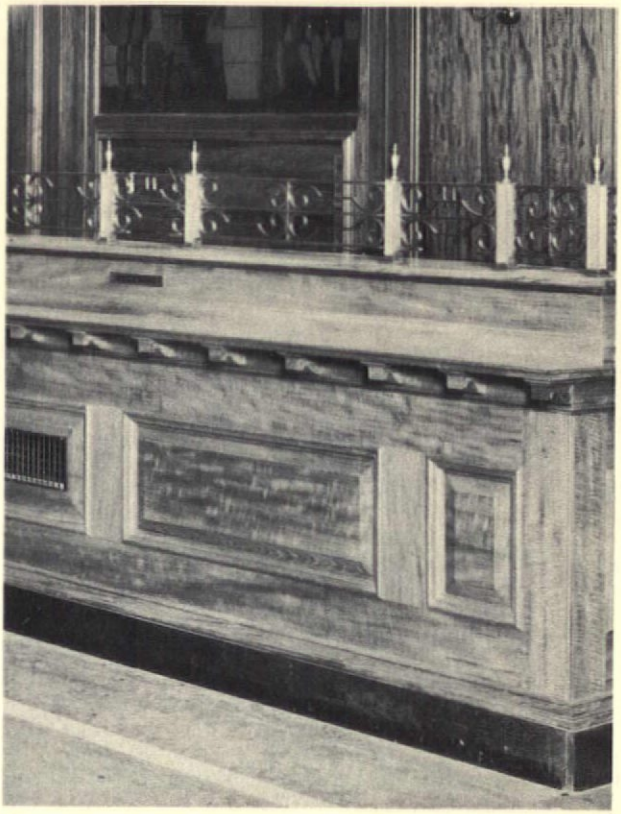


*Smith, Hinchman & Grylls*



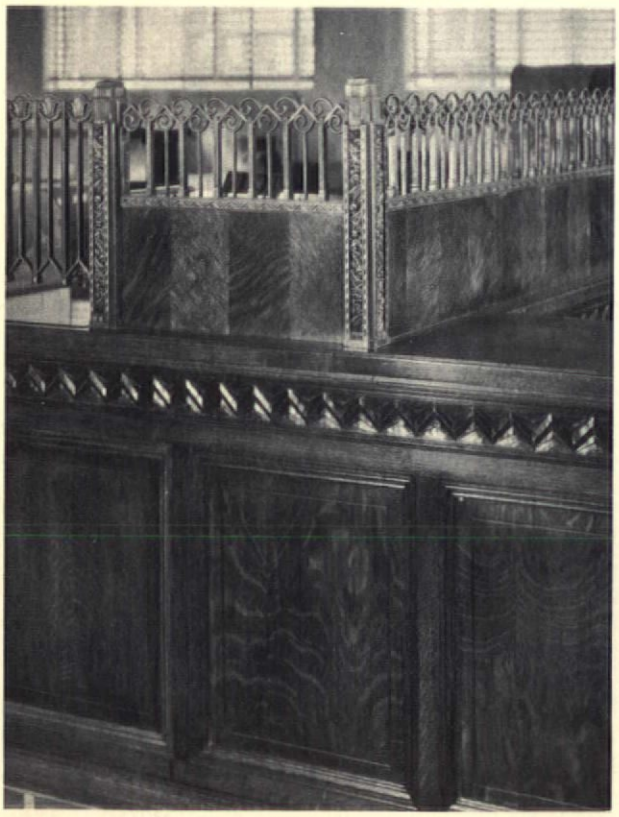


*Virgil Westbrook*

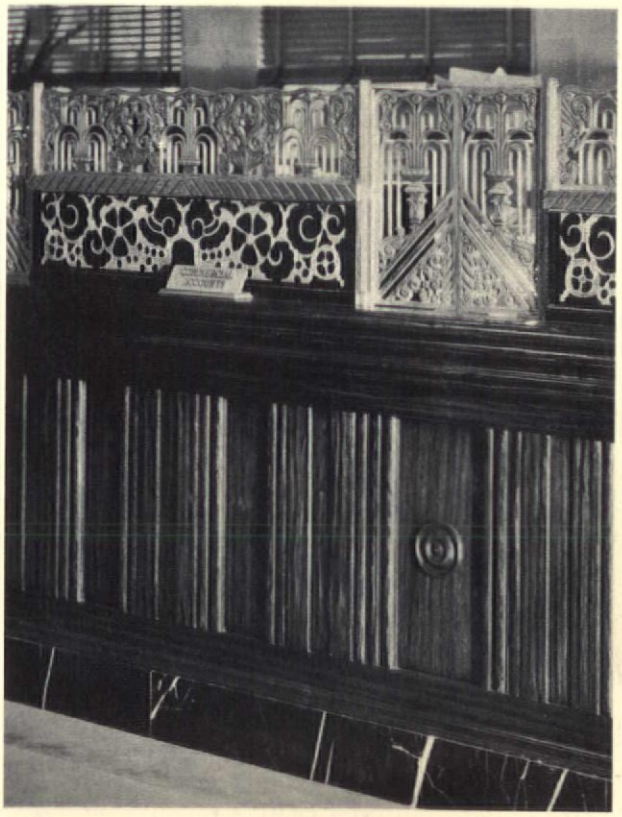


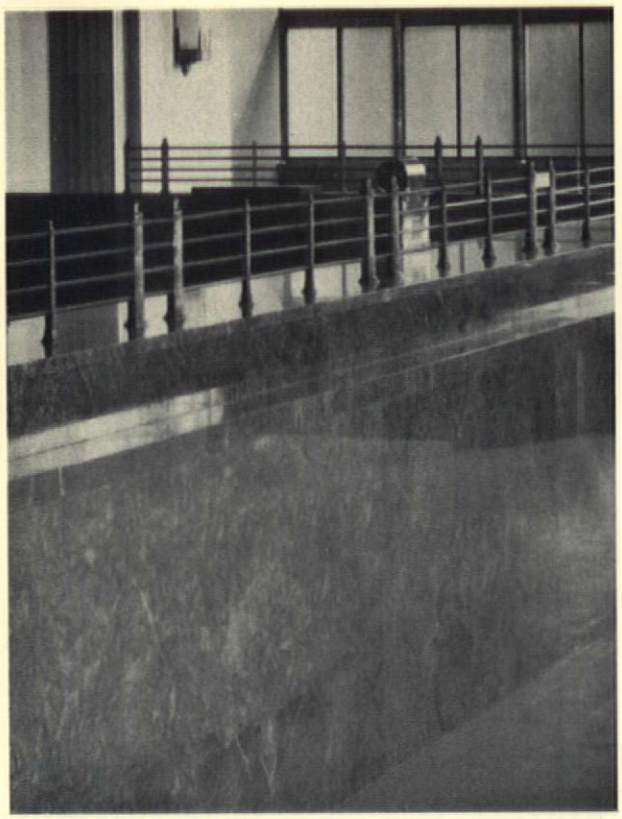
*Howe & Church*

*John Parkinson and Donald B. Parkinson*



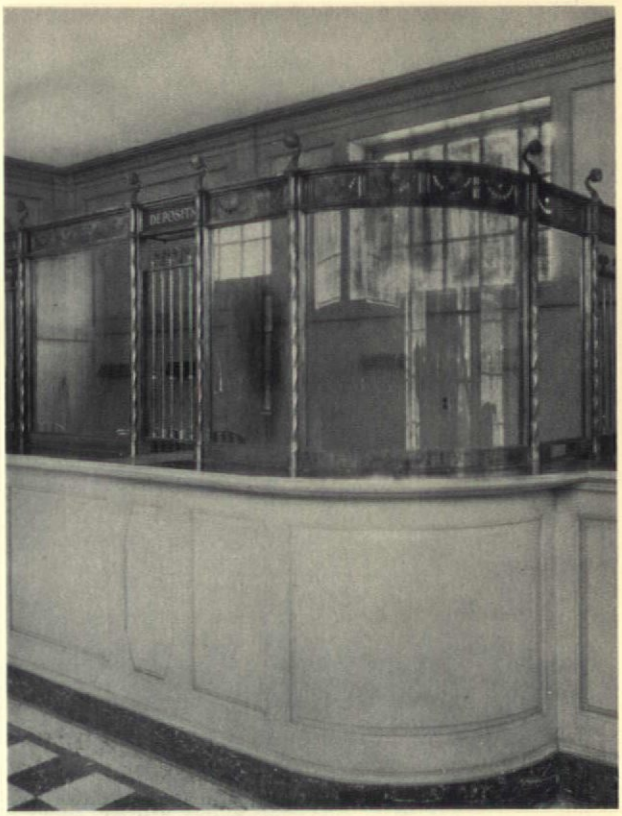
*Alfred F. Priest*



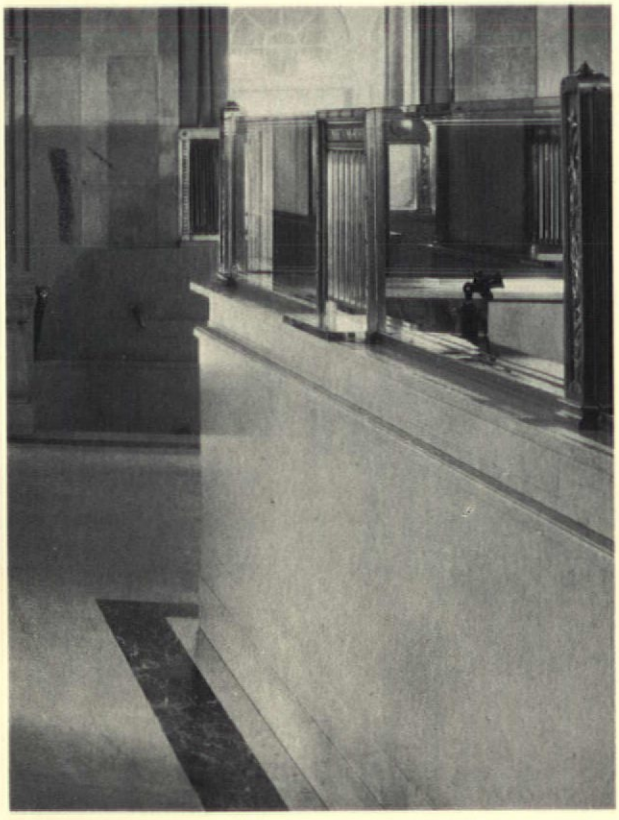


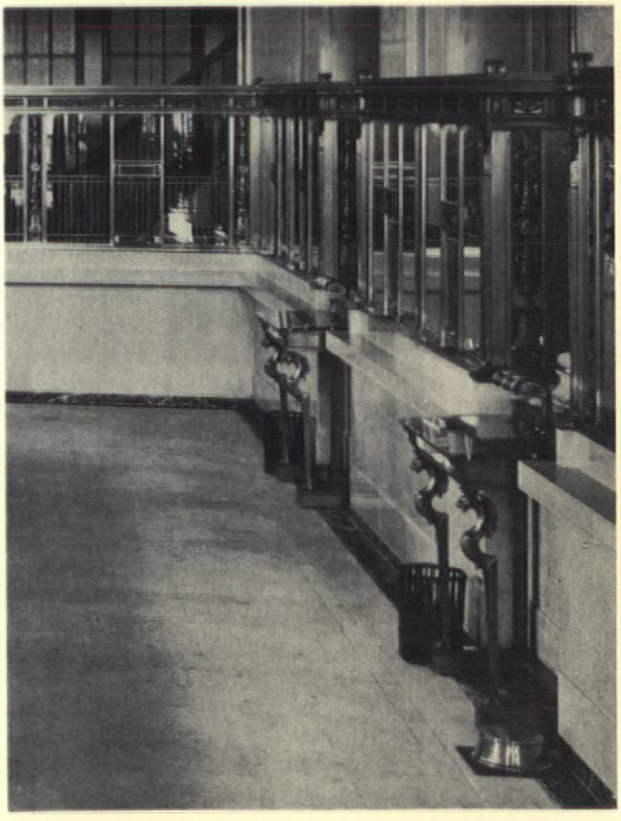
*The State Bank and Trust Company, New York City*

*Charles G. Loring*



*George F. Pelham* *Montague Flagg*








*WASH SHEDS ON THE RIVER EURE, CHARTRES*

*From the pencil drawing by Carl Loven*

« ARCHITECTURE »

ARCHITECTURE

VOLUME LXVII FEBRUARY 1933 NUMBER 2

# The Hospital, Today and Tomorrow

*By Carl A. Erikson*

OF SCHMIDT, GARDEN & ERIKSON, ARCHITECTS

THE permanence of architecture is at once its joy and its sorrow. The architect's pleasant dreams and his ghoulish nightmares alike become terrifyingly and conspicuously permanent over the face of the earth. The painter, the sculptor, the musician, the writer—all the arts—have a garret of the forgotten; but the architect stands before this generation, the next, and the next, and the next, just as he is—in all his nakedness.

Yet the architect is but the creature of his environment and of his client. No matter how much we prate, that fact remains even more permanently than do our buildings. Pericles might have understood Cret. But imagine, if you can, Corbusier and Lorenzo the Magnificent. How about Wright and the Merrie Queen, Cram and Nero?

Hospitals are never destroyed and seldom remodelled. And obsolescence is a word not found in the hospital lexicon. And yet hospital technique, clientele, and personnel have been completely changed in fifty years. It isn't surprising then that the architects having much to do with hospitals become impressed with the permanence of the buildings they leave behind—spending days and nights (once upon a time) trying to push the existing buildings around to permit enlargement. While there are forces which will require the rebuilding of many other kinds of buildings, there seems to be none that can effect the rebuilding of a hospital building. Once it is, it always is.

Nothing more aptly illustrates how completely the environment and the client dominate the architect. Modern medicine made the modern hospital. It is now, and always has been, utilitarian. It is a workshop—for the humane, kindly, and efficient care of the sick—the like of which the world has never before known. And it has developed in less than fifty years. But medicine has progressed so rapidly that the hospitals have never had the time to take inventory. They are very like the factory that finds building after building is needed to meet the demand, yet it has neither the time nor the capital for the rearrangement necessary to lower operating costs. A practised eye is hardly necessary to disclose similar wastefulness in some of our older and larger hospitals. The possession of three or four X-ray Departments is hardly much worse than the alternative—in one hospital—of an hour's transport from one important patient's group to and from the single X-ray Department. Four and five kitchens are not uncommon in the older hospitals. Three and more Operating Departments are not unusual—but can hardly be deemed efficient. While recent years have seen an enormous growth in hospitals, the next few years should see the hospital's integration through remodelling to permit more efficient operation.

In the hospitals, the patient—numbers and kind—is necessarily the first consideration. Even though they are correct who anticipate a marked reduction in our rate of population increase, there are many factors that will offset a similar effect in the number of patients using the hospital. The steadily declining death rate and immigration mean an increase in the average age of the inhabitants. As children are not found in the hospitals in proportion to their numbers in the population, the increase in older folks will add to the patronage of the hospital. If the predictions of many of our housing experts come true—that the permanent domiciles of our people will continue to grow smaller—our hospitals must inevitably become larger, or more numerous. "Efficiency" apartments become very deficient ones when sickness enters. If medicine continues to increase its dependence on diagnostic and therapeutic devices that are

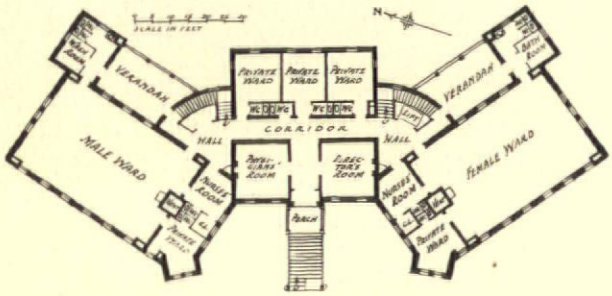


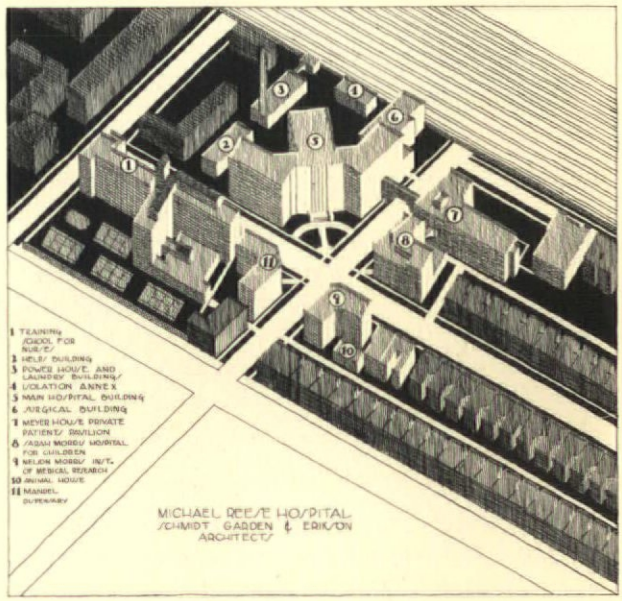

best assembled in the hospital, a further increase in hospital beds may be expected, as well as increases in space assigned to these auxiliaries.

Decentralization of population, which some tell us may be expected in the next few decades, will probably increase the number and size of hospitals to serve those communities. It is hardly to be expected, though, that it will retard the development of the large hospitals, for they have some obvious advantages in the massing of personnel and equipment, and in the classification of patients.

But what manner of man is this patient? A cross-section of the community, to be sure. With one eye on the obstetrical ward, it is still generally true that sickness, like rain, falls alike on the just and the unjust, on the rich and on

*Above, Michael Reese Hospital, Chicago—the bridge across Twenty-ninth Street. Below at the left, the plan of the original unit prepared in 1883 or 1884. Below at the right, a bird's-eye view of the present institution with a capacity of 659 beds. For this number of beds the hospital finds it necessary to provide housing for 447 nurses and 50 internes. The hospital contains approximately 4,000 cubic feet per bed. Schmidt, Garden & Erikson, architects*

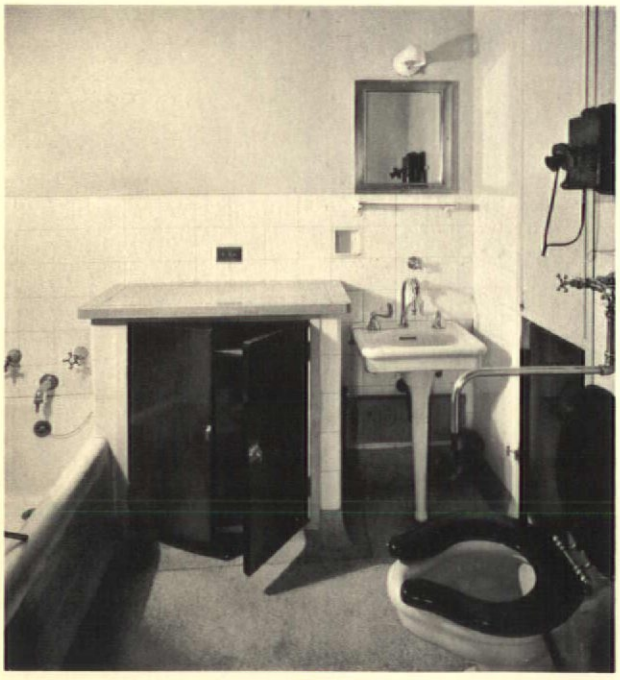


the poor. A few years ago there were many who believed—and cited statistics to prove—that the beds for the poor were too numerous. Rorem's studies for the Rosenwald Fund conclusively demonstrated the change in the kind of housing provided for the patient in the past decade. Luxurious private rooms *ad infinitum*, many small wards, were the usual programme. The studies of the Committee on the Cost of Medical Care show that the rich are well provided for, the poor moderately so, but the in-between—the "white collar" classes—are hopelessly ignored in hospital care. Their efforts to out-do the Joneses; whether it be in autos, in sickness, or in death, has been, in part, the cause of the great production of hospital quarters now too luxurious and expensive. If hospitals have over-provided for this group, parallels may be found in almost every kind of building during the past decade: hotels, apartments, houses, offices, etc. Unlike these, the conversion of hospital rooms into less expensive ones is a relatively simple matter, and usually a gain to the community.

The care of the sick "middle-class" is a problem so much bigger than the hospital, that we had best prayerfully leave it to the Committee on the Cost of Medical Care. But hospital building of the future will be strongly affected by the effort to find a solution. I am convinced that one way to lower costs will be through the greater efficiency of the physical plant to avoid expensive duplication of space, personnel, and equipment. Another factor may be the introduction of group nursing. Under such a system a small group of patients is assigned to a squad of graduate nurses who relieve one another, so that one nurse is always on duty. This costs the hospital more than ordinary or "floor care" nursing by pupils. The patients pay more for it, but very much less than for special-duty nurses, unnecessary in the majority of cases. A number of experiments along these lines have been undertaken, but no standards have yet emerged. It is agreed, however, that this type of nursing works best if each group has its own sink and toilet room.

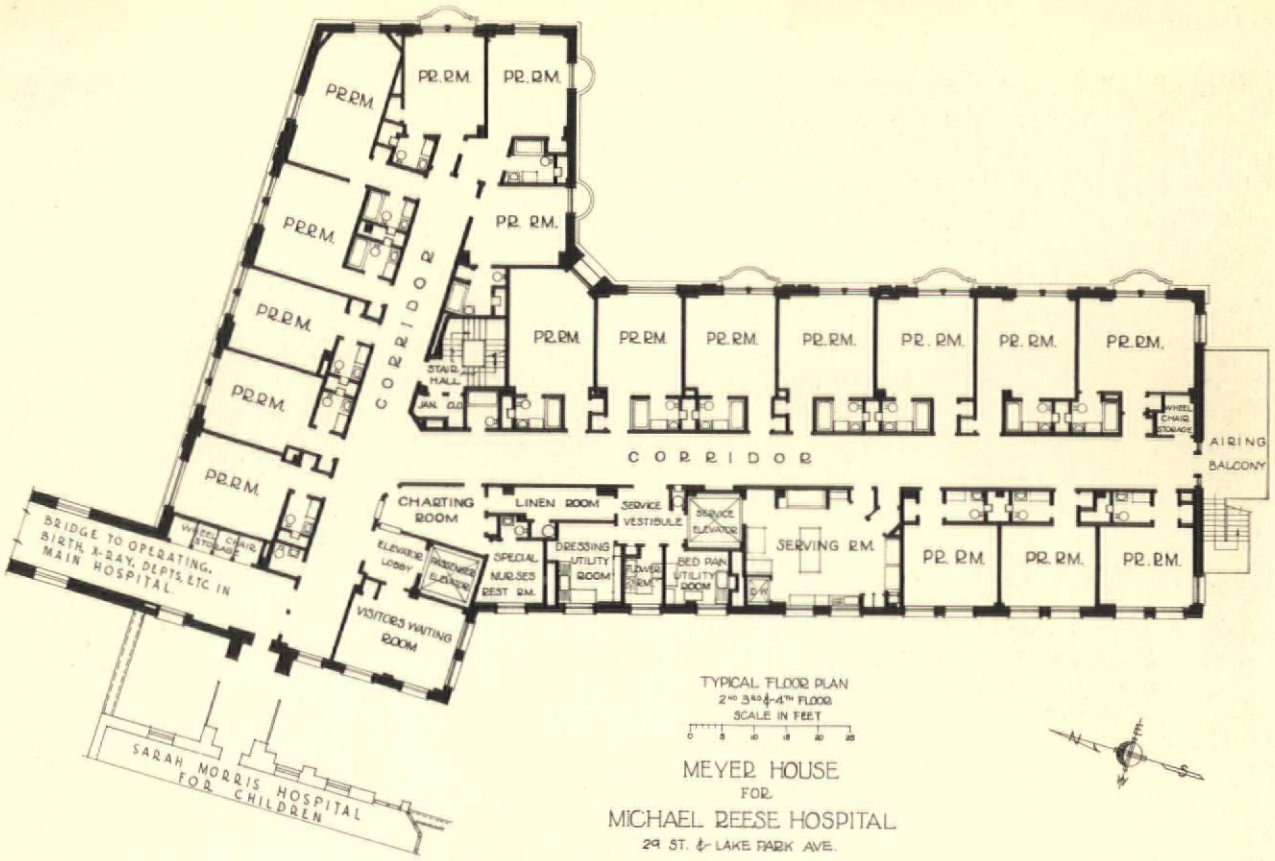
In other ways, the nursing may affect future planning. The nursing organizations are furiously protesting the "overproduction" of nurses. Some are also objecting to the apprenticeship system, under which the hospital sick is cared for by pupil nurses at a supposedly small cost to the hospital. If the number of pupil nurses is reduced, or the apprenticeship system in training them is abandoned in part, then interesting possibilities may become probabilities. In either event, hospital planning will be strongly affected by the elimination, in part at least, of an educational problem. The size



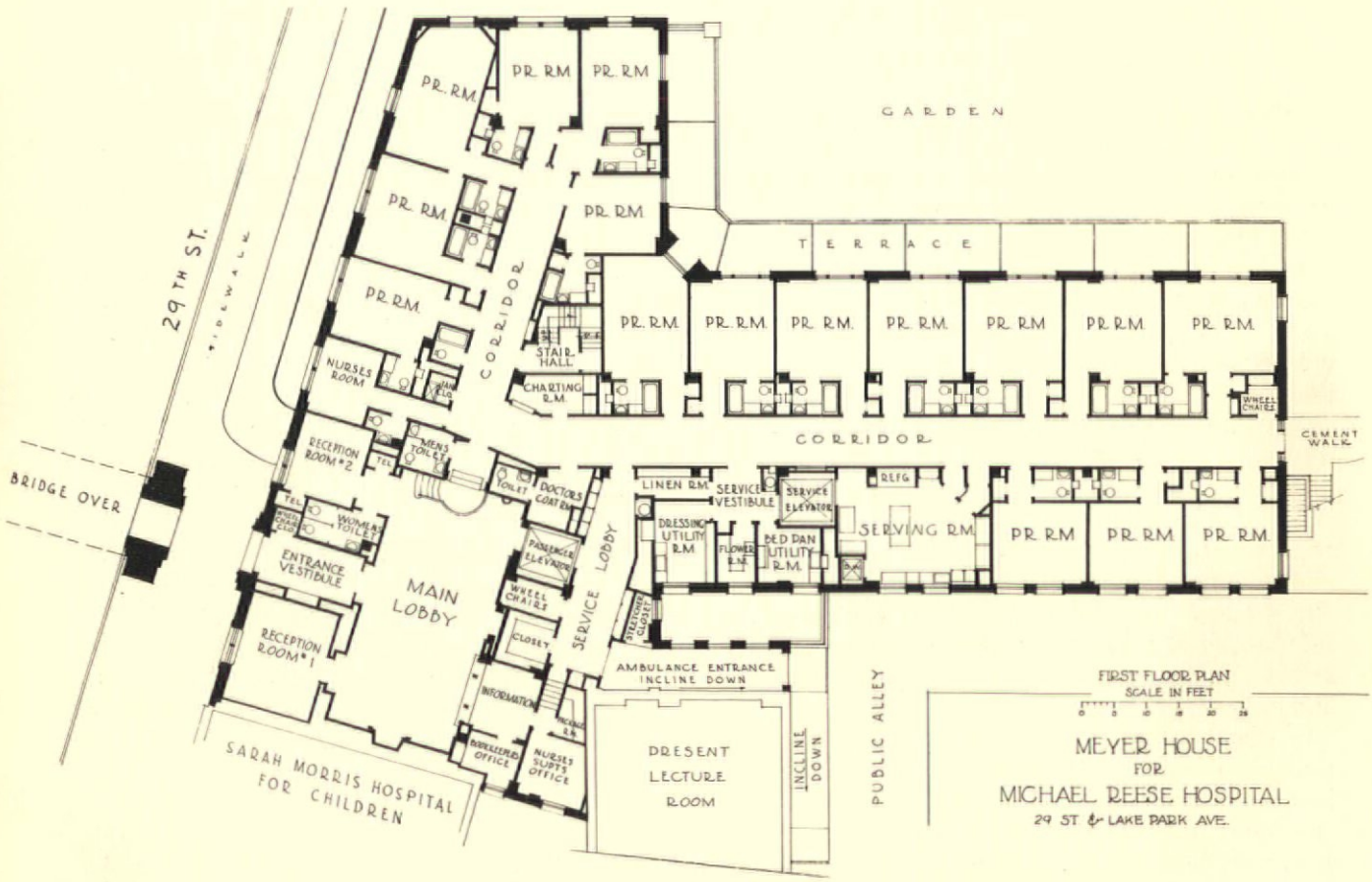
*A service room in Meyer House (for private patients). In this division of Michael Reese Hospital each private room has its own private service room*



*A corridor in Meyer House. Extensive use has been made of sound-absorbing materials both in the corridors and in the service rooms*




*Above, a typical floor plan of Meyer House, and below, the first-floor plan of the same building in the Michael Reese Hospital group. Schmidt, Garden & Erikson, architects*



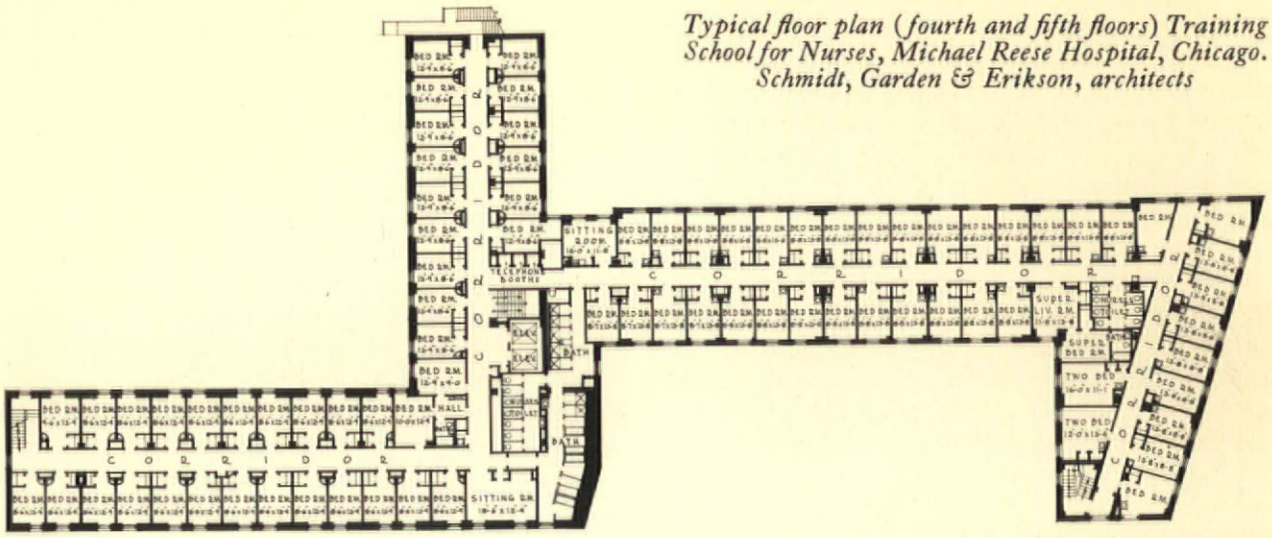


*The main lobby of Meyer House, the location of which may be seen on the first-floor plan opposite. In keeping with the purpose of this building, the interior finish is of an unusually luxurious character*

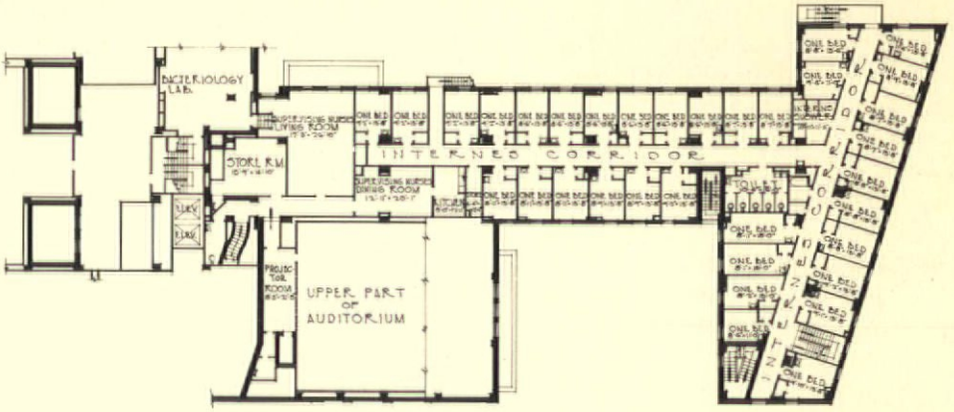
of the nursing unit (the number of patients under one supervisor) has been partly determined by this educational problem. If the nursing is to be done by graduates and their assistants, the nursing unit may be very considerably enlarged. The nurse in charge, having no educational duties, will be a mere supervisor. The unit may, therefore, be greatly increased in size, perhaps to two or three times as large as it is now.

A third factor of tremendous potential, but unpredictable, influence lies in the Science of Medicine. Money and workers have been poured into medical research until I imagine that the total number of workers so engaged would surprise most of us. Research has made the modern hospital possible. It has made it safe to group a large number of sick people together. Fifty years ago the few hospitals were the last resort of the poor and of the strangers who became desperately ill. Today even the multi-millionaires (have we any left?) use the hospital for serious illness. But research has at the same time eliminated the need for many hospitals beds. The conquest of yellow fever, the suppression of typhoid, the reduction in scarlet fever, diphtheria, and many other diseases of childhood—all of these and many other results of research have decreased the use of the hospital. But on the whole, developments in medicine tend to greatly increase the needs for hospital beds as well the doctors' dependence on the personnel and equipment assembled in the hospital. The stethoscope and the thermometer, the simple equipment of yesterday, are supplemented by extensive laboratories—by 1,000,000-volt X-ray apparatus, by the cardiograph, by basal metabolism, and by many other almost magical devices. Simultaneously there has developed increased reliance on non-surgical treatment in the hospital. Diet, various forms of physiotherapy, oxygen treatment, the X-ray, and many similar devices, now play important parts in the restoration of health. Should both of these tendencies continue, further expansion of these departments and introduction of new ones may be anticipated.

The hospital of today is but the child of scientific medicine. I have tried to indicate some of those things that may influence its fu-




*Typical floor plan (fourth and fifth floors) Training School for Nurses, Michael Reese Hospital, Chicago. Schmidt, Garden & Erikson, architects*




*Mezzanine floor plan, Training School for Nurses, Michael Reese Hospital. This space and part of that above it on the next floor is utilized for internes' living quarters, with a separate stairway to the first floor*

ture physical manifestations, but who can predict the development of any robust child?

Will the care of mental illness become an important part of the general hospital, as many believe that it should? Might it not be advantageous to meet the ever-increasing requirements for care of patients—now called chronic—by special departments in general hospitals? Should the general hospital care for the contagious cases? Is the pride taken by the general hospital in the lowered average days' stay in the hospital entirely justified? Is it caused by the great influx of tonsil cases (usually only one day in the hospital), by the great demand for beds, by the cost of hospital service, or by improvement in medical and hospital service alone? Might it not be to the advantage of the community to prolong the patient's stay to insure proper care? Is it possible that convalescent cases, now given attention at separate hospitals, might be advantageously cared for in separate sections of the general hospital? Need the general hospital shun tuberculosis? What about the care of the advanced cancer patient? Will the doctors' offices be a part of the hospital group? Where are the funds to build and operate the hospital of the future to come from—some form of health or hospital insurance, from governments, or through the liberalty of the wealthy? What will the medical practice of the future be?

If any one can correctly answer all of these questions, we should then have a basis for some guesses about the ultimate future of the hospital building. The unsolved problems are numerous—but hardly more so than in 1882. While it is hardly safe to generalize from the physical development of one hospital, yet a comparison with a hospital of 1882 and one of today will illustrate some very startling differences. Michael Reese Hospital of Chicago is used because it was considered a well-planned hospital when it was completed in 1882, it is now one of the better-known institutions of the country, and, finally, accurate data is available.

The Michael Reese Hospital of 1882 contained 360,000 cu. ft., 70 patients—about 5,200 cu. ft. per patient; the Reese of today contains

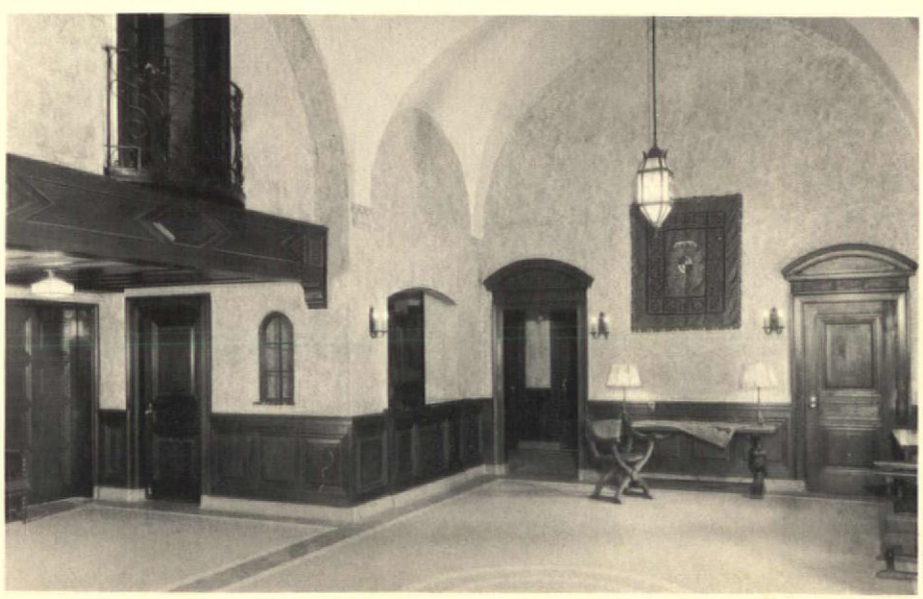
7,300,000 cu. ft. for 650 patients, or about 11,000 cu. ft. per patient. While it is difficult actually to determine the reasons for all of the increase per bed, it is relatively easy to account for a large part of the increase of 5,800 cu. ft. per bed. Sixty per cent is due to housing the increased number of nurses, internes, and help now found necessary; 9 per cent to the large Out-Patient Department, 9 per cent to the laboratories—practically non-existent in 1882. Probably half of the remaining 22 per cent may be accounted for by provision of departments—unknown in 1882—such as X-ray, cardiography, physiotherapy, metabolism, etc. Perhaps the other 10 or 11 per cent is accounted for by the change in kind of patients' quarters and the improved auxiliary rooms for their bedside care.

A rather startling comparison! But it is hardly safe to predict that a similar growth will take place in the next fifty years. A most powerful brake in the continuance of this tendency will be the cost of producing and operating such space. Hospitals have been built in which but 11.6 per cent of the gross area of the building is used for housing patients; 15 per cent is a not uncommon figure. Somehow this area must be increased—if it continues to decrease we will shortly be building hospitals without patients. They will be store houses for equipment. One hospital has a useful but cumbersome piece of apparatus used in applying plaster casts. It is used about two hours per week in a room devoted solely to that purpose. Some day that hospital will find a way to quickly and easily store that apparatus so that for some part of the other 166 hours of the week the space may be used for other purposes.

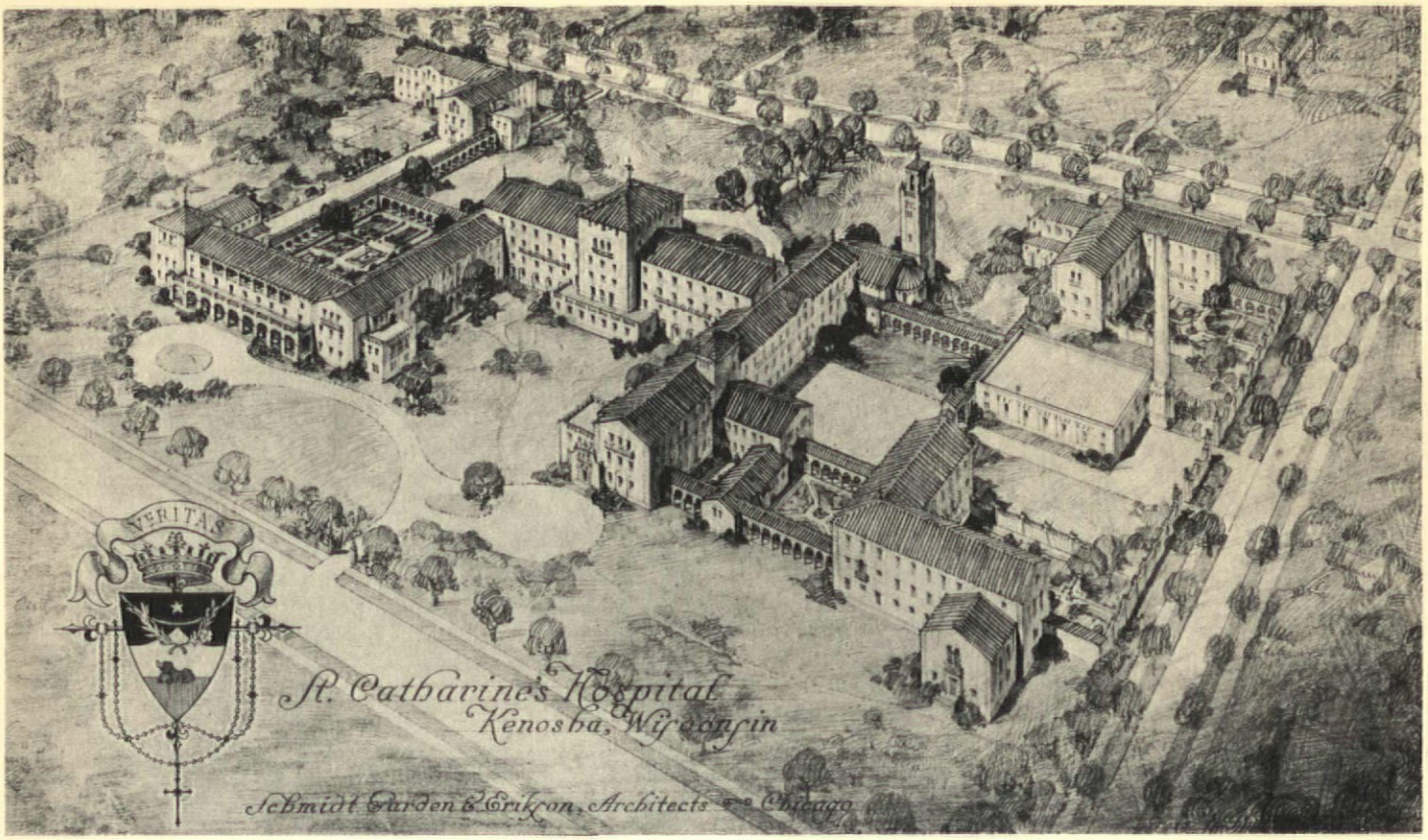
It is hardly necessary to discuss the effect that changes in building methods and materials, now being so fully discussed, may have on hospital building; the hospitals have been ready always to adopt methods and materials of proven worth.

To the architect the hospital is the most fascinating of sirens. It is all things to all architects. To some it presents the lure of humanity—assisting in relief of suffering. To others, an intellectual lure—the mental stimulus of chess or other problems capable of infinite variety of solutions. Some find its stimulus that of exploration into the unknown, where the inhabitants speak a polysyllabic language and perform magic rites that surpasseth the architect's understanding. To some the hospital is hardly more than a jig-saw puzzle, in which the whole picture clicks into place after much trial and error. Because the hospital is so long-lived, many architects find it an opportunity to do a beautiful building. Sometimes the results are as ludicrous as the efforts of one of our architects who dearly loves his Georgian. In his last hospital the front presents all of the Georgian beauty—rich in brocades and laces, even the powdered wig and the tantalizing curl are there to complete the illusion. But, we dare not ask her to step the stately minuet, for the poor dear is stripped naked in the rear. And the dastardly medical authority who stripped her has laid deep lashes—of Corbusier-like balconies, six feet wide, and enormous windows! And that nightmare will be terrifying and conspicuously permanent over that part of the earth forever more.

Having let down my guard that far, perhaps it would be just as well to invite any one who has read to this point to finish the article. I know that he will have looked at the illustrations before he began to read, so that comments by me on the mechanics of hospital planning will be redundant.



*Garfield Park Hospital, Chicago. The main lobby. Schmidt, Garden & Erikson, architects*

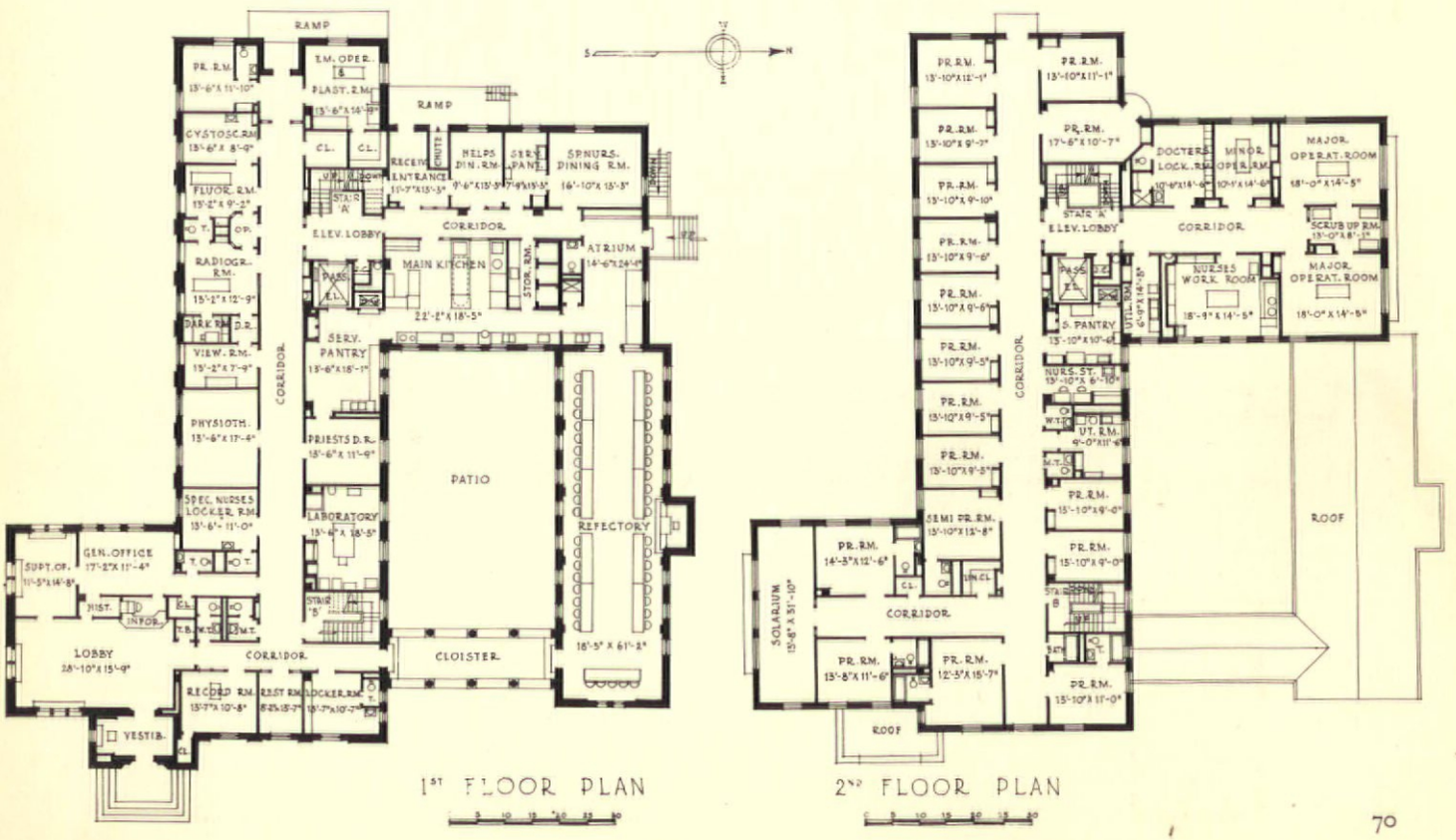


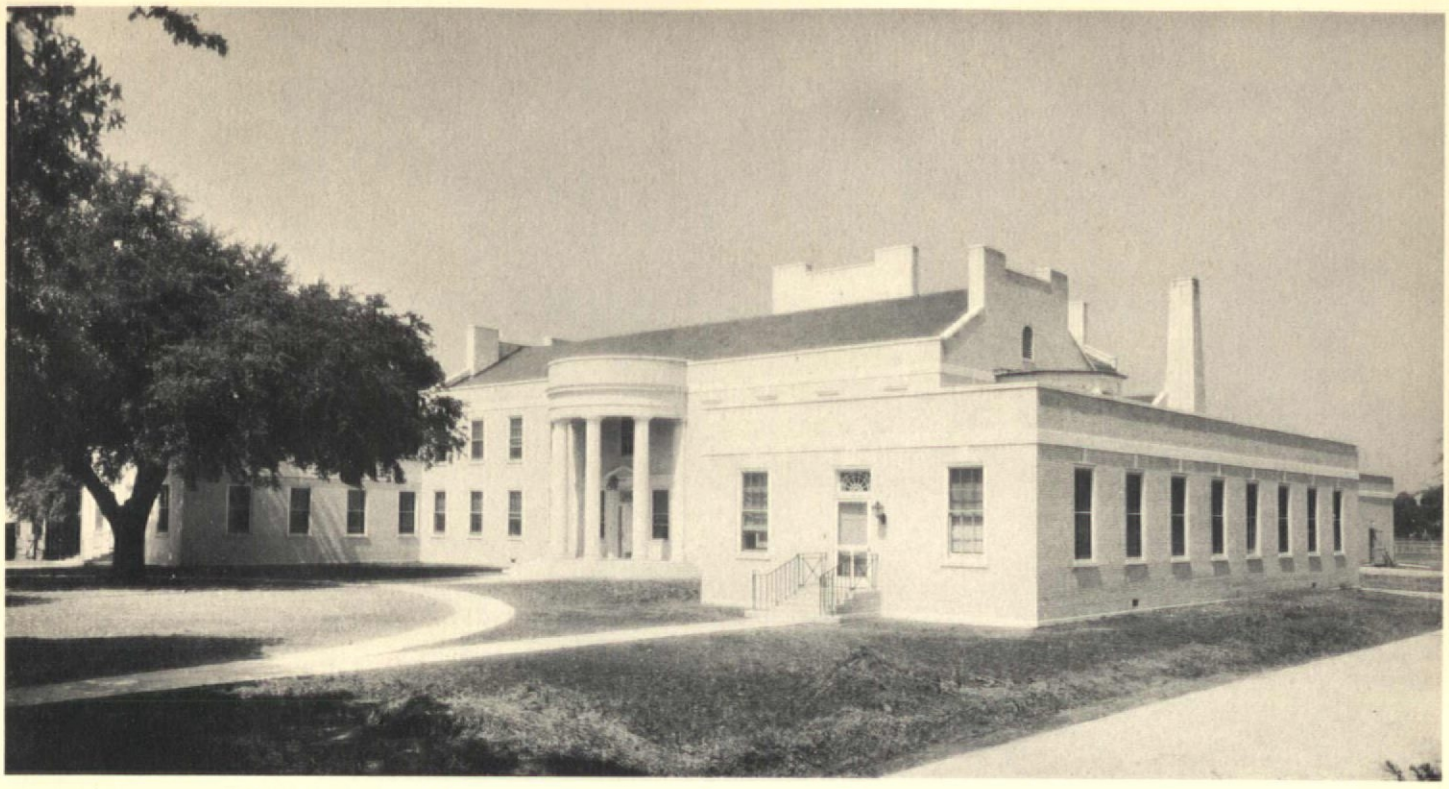

## St. Catharine's Hospital, Kenosha, Wis.

### Schmidt, Garden & Erikson, Architects

*Here was a site over 800 feet square, the ground fairly level. The problem called for a 40-bed hospital at a minimum cost consistent with good construction, and the unit was to be made part of a much larger group. The hospital is conducted by the Sisters of St. Dominic. Unlike most Catholic hospitals, however, the nursing is done by Sisters.*

*The exterior is of a Chicago common brick with variegated red tile roof. Bedford stone is used for trim. It is expected that the common brick will be painted or stained white in the next building development*

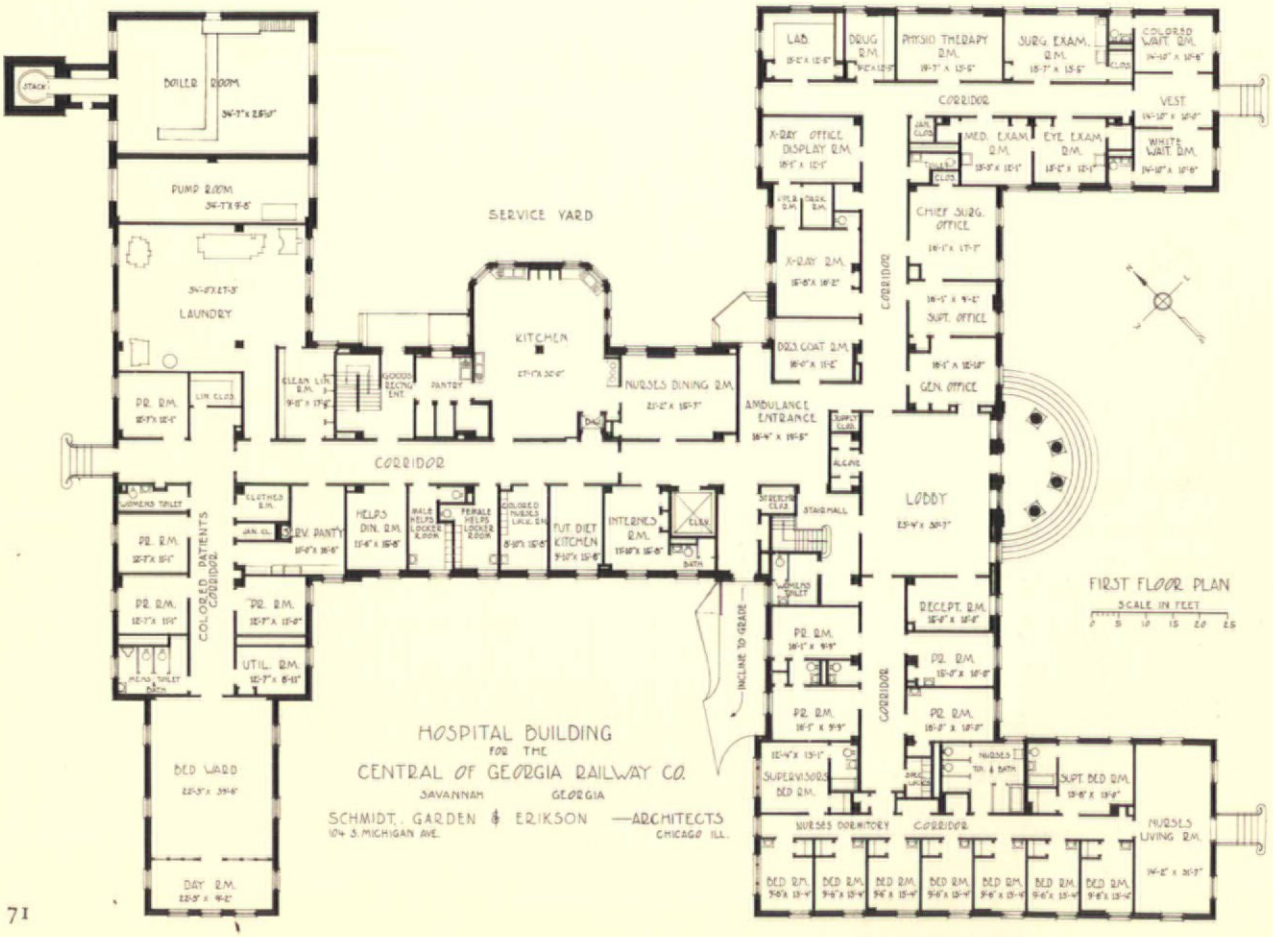


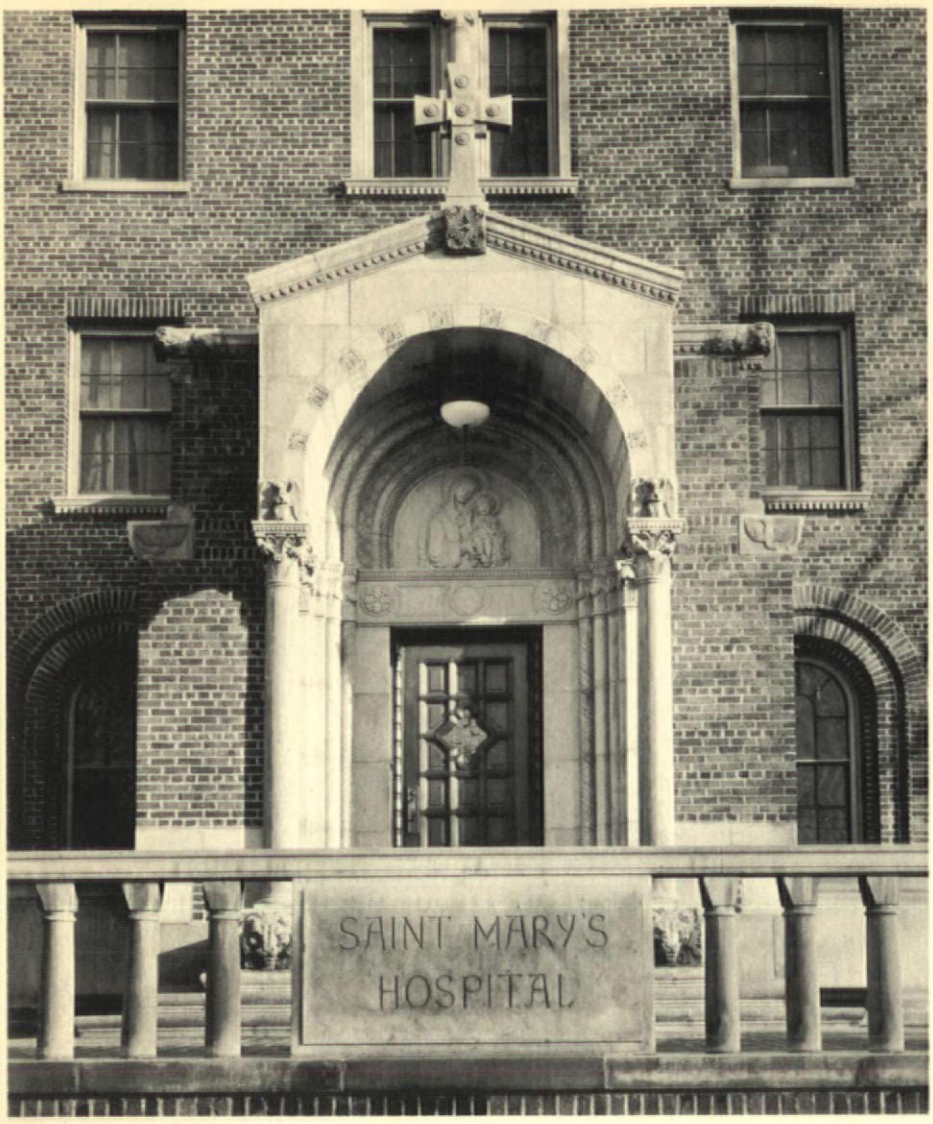


CENTRAL OF GEORGIA RAILWAY COMPANY HOSPITAL, SAVANNAH, GA.

SCHMIDT, GARDEN & ERIKSON, ARCHITECTS

*The site is in an outlying residential district. In this climate the west rooms were undesirable, the cooling breezes coming from the south and east. The north rooms are not objectionable during the summer. The hospital is primarily for the railway company employees, but is open also to private patients of the staff physicians. Fifty-seven beds were to be supplied, of which 12 for the colored people were to be segregated. The building contains 586,000 cubic feet; or 8,750 cubic feet per bed, and 10,250 cubic feet per patient's bed*



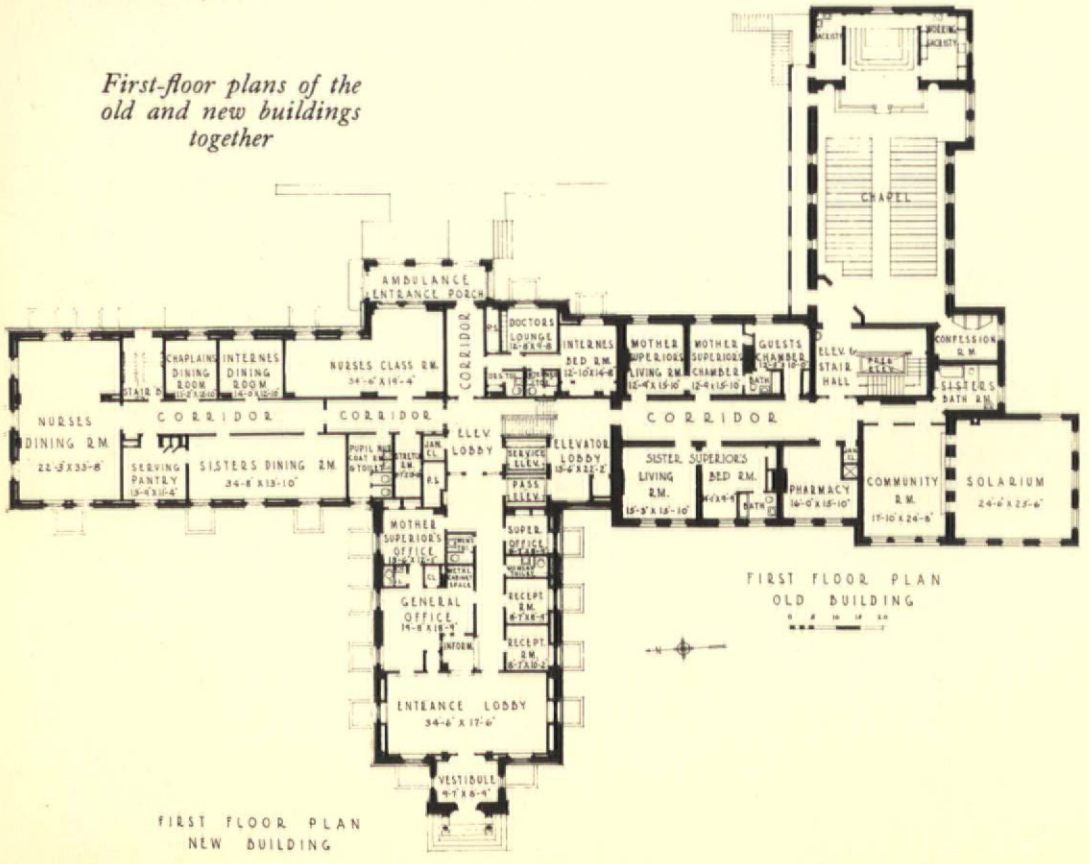



*Here was a problem of adding to an existing hospital of about 60 beds, increasing the capacity to 150. Necessarily this required a consideration of all the auxiliaries, most of which were too small for this increase. Moreover, provision was to be made for further expansion.*

*The existing building was between 30 and 40 years old, in too good condition to wreck. The story heights were excessive. Considerable study was required to adjust the floors of the new building so as to permit the passage of wheeled apparatus across without long and high ramps. The elevators serve both buildings*

ST. MARY'S HOSPITAL,
SAGINAW, MICH.

*First-floor plans of the old and new buildings together*

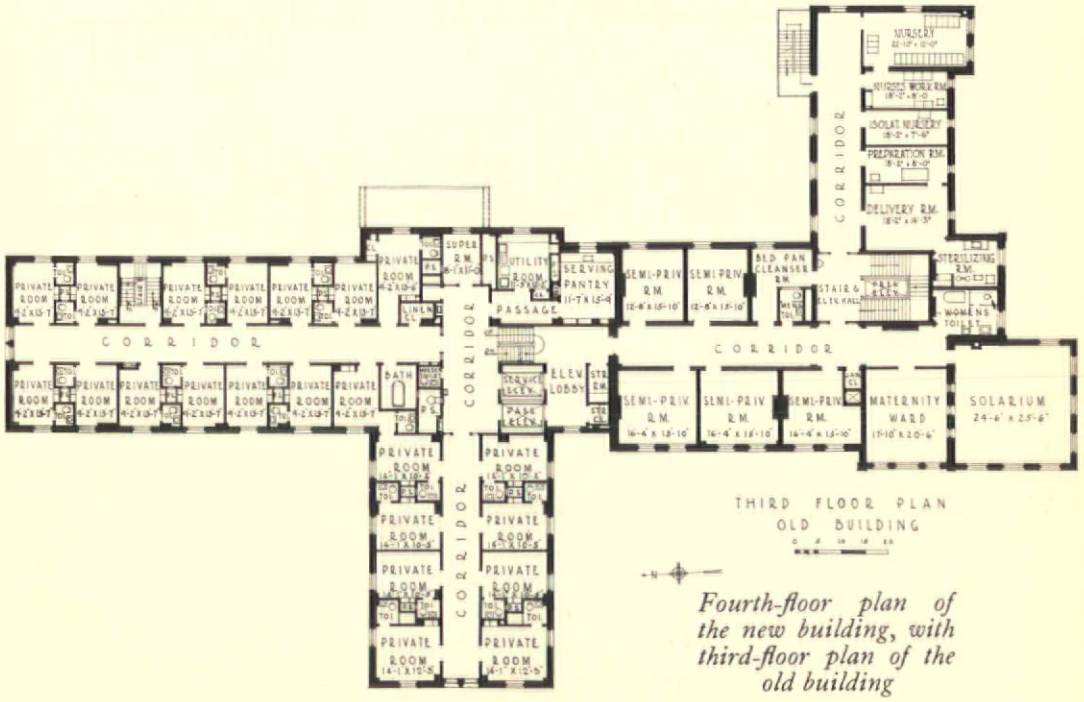




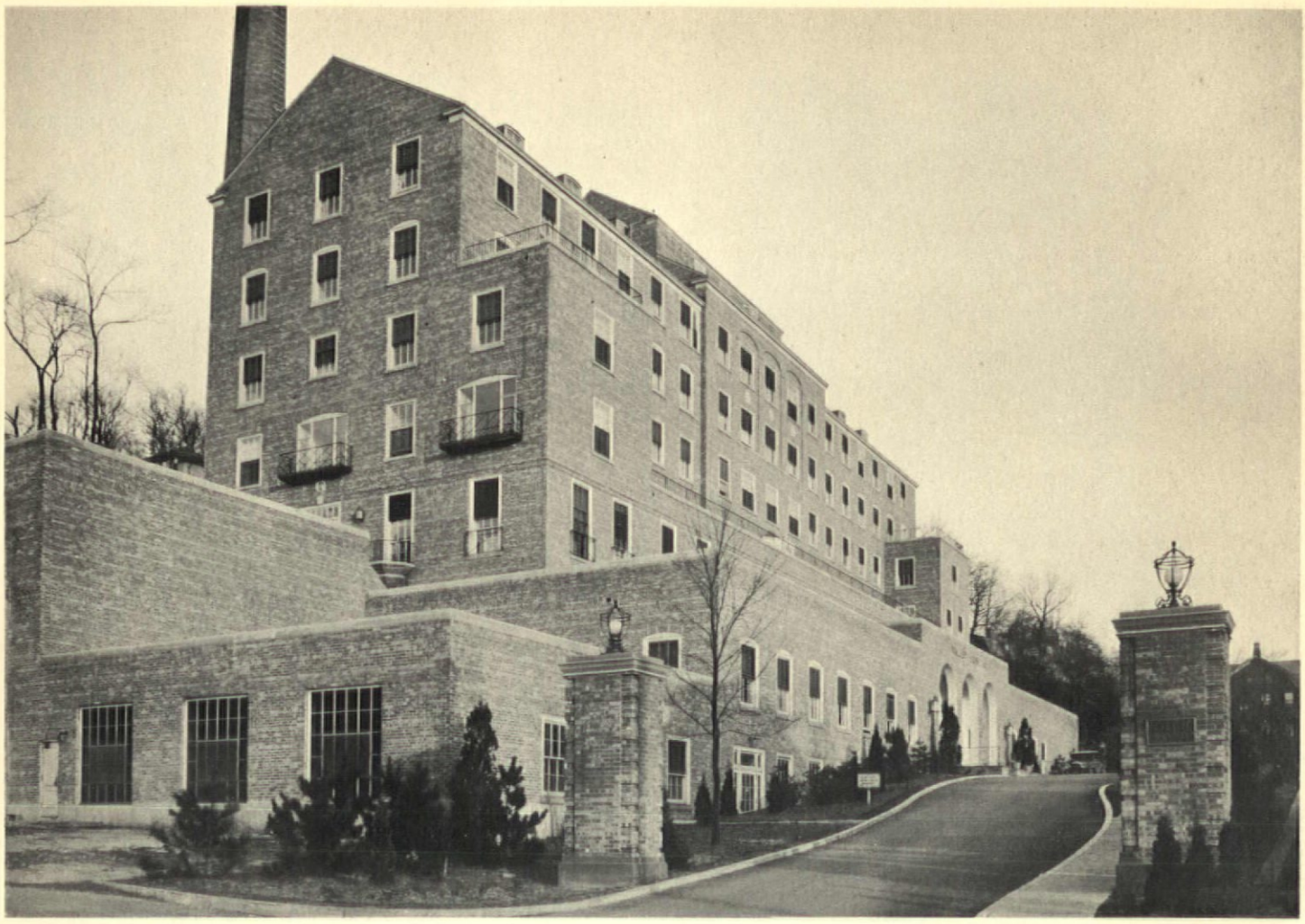
*The large rooms in the old building are used for wards. Patients' rooms in the new building are all small private rooms, each with its private toilet.*

*The new building contains all of the facilities of the hospital proper. The old building contains the wards, chapel, the birth department and the kitchen. The latter is unusual in that trays are set up in the serving room adjoining the kitchen on unheated, open food carts, carried up on the elevators and through the corridors to the rooms*

SCHMIDT, GARDEN & ERIKSON, ARCHITECTS



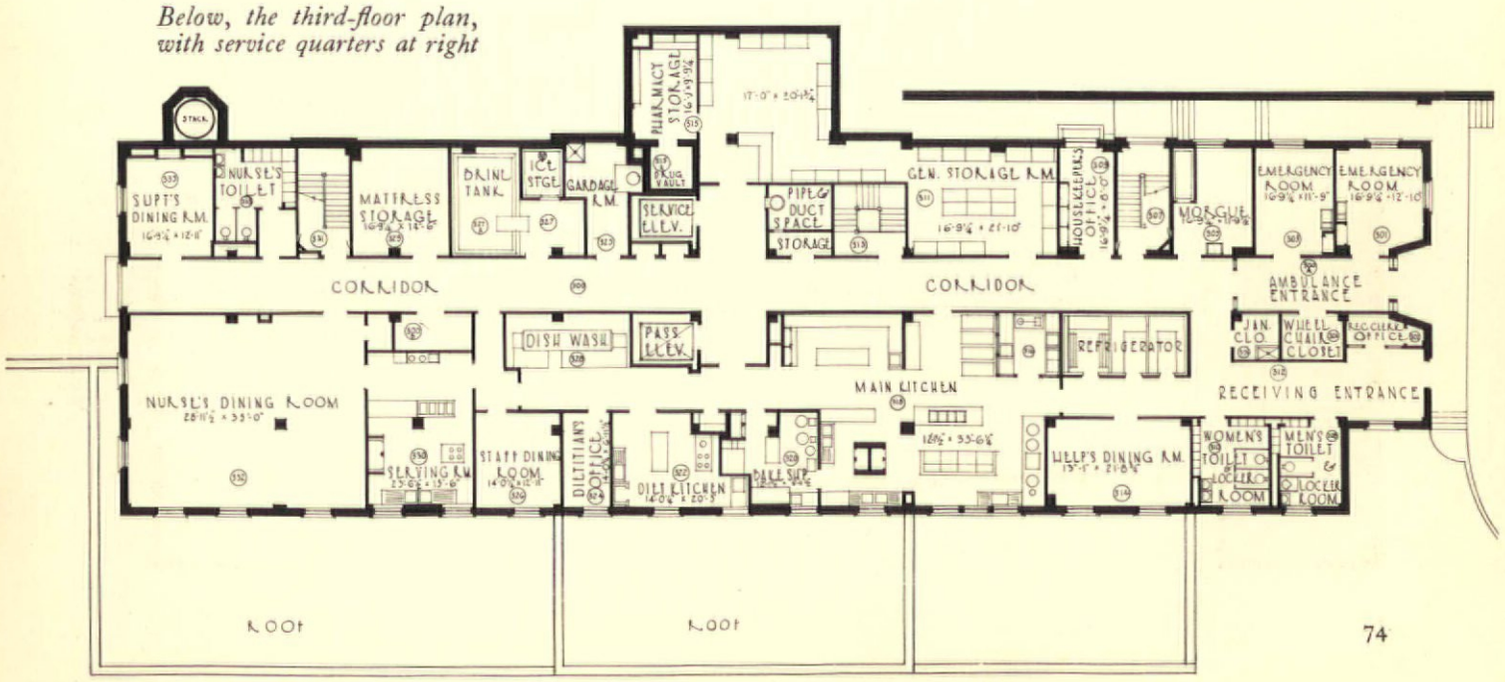

*Fourth-floor plan of the new building, with third-floor plan of the old building*



VALLEY HOSPITAL,
SEWICKLEY, PA.

*Existing building consisted of a 50-bed hospital and a nurses' home, both of ordinary construction, and both so located that it was impossible to enlarge either of them. The programme called for a new 110-bed hospital complete in itself; conversion of the old hospital building into a nurses' home; and conversion of the old nurses' home into a help's building. Contours of the site were such as to permit of an unusual yet logical*

*Below, the third-floor plan, with service quarters at right*



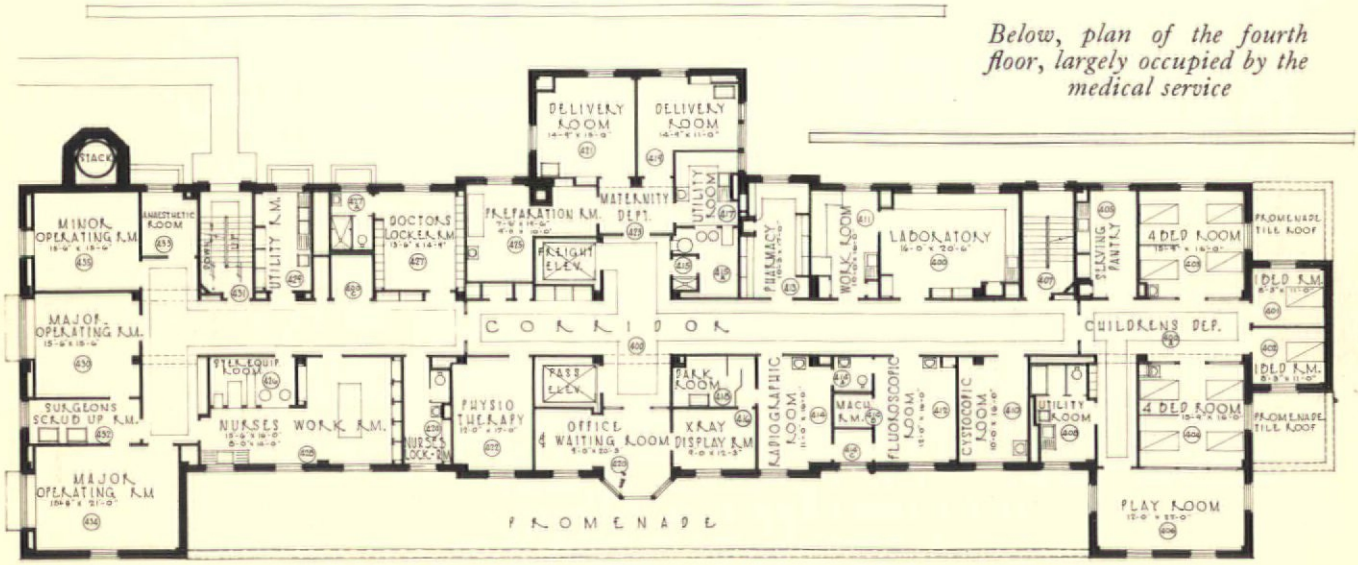


*arrangement of the various departments. Patients' rooms are all in the upper three floors of the main building. Below these are the medical services, then the kitchens and dining-rooms, the laundries, then offices, and below all, the power house and engine rooms. The cubic contents of the building total 884,000 cubic feet, or approximately 8,000 cubic feet per patient's bed*

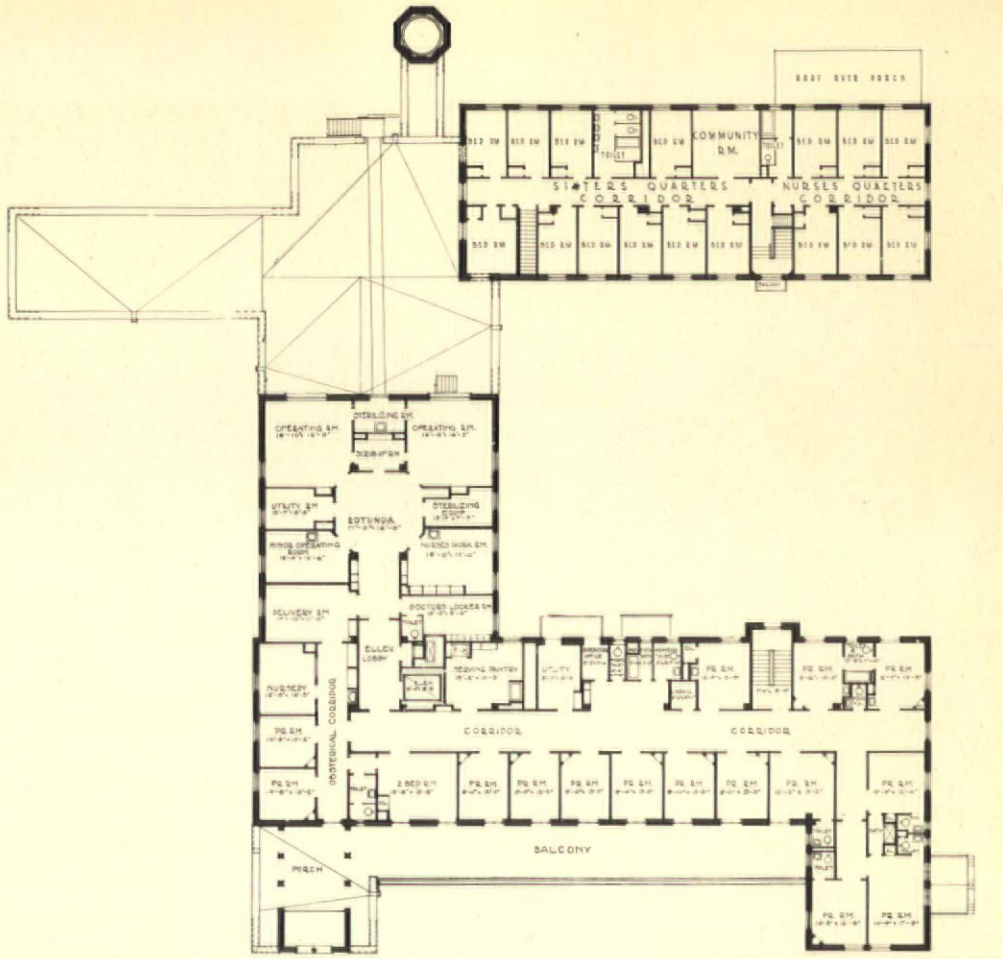
SCHMIDT, GARDEN & ERIKSON, ARCHITECTS;

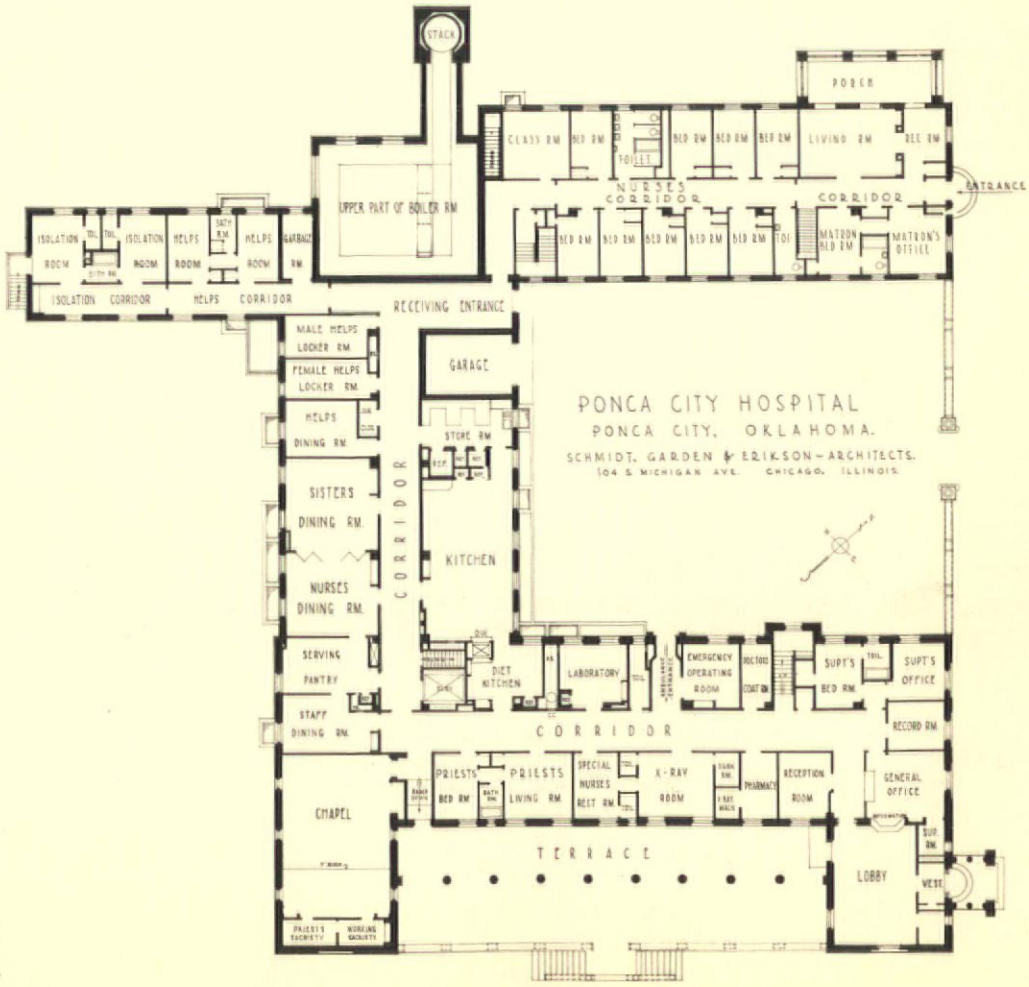
S. S. GOLDWATER, M.D., CONSULTANT

*Below, plan of the fourth floor, largely occupied by the medical service*




FOURTH FLOOR PLAN


ROOF OVER PORCH
SISTERS QUARTERS
CORRIDOR
COMMUNITY RM.
NURSES QUARTERS
CORRIDOR
BED RM
STERILIZING RM.
OPERATING RM.
SCRUB-UP RM.
UTILITY RM.
ROTUNDA
STERILIZING ROOM
MINOR OPERATING ROOM
NURSING INSPR. RM.
DELIVERY RM.
PICTURED LOCKER RM.
ELLEN LOBBY
NURSERY
SERVING PANTRY
OBSTETRICAL CORRIDOR
PR. RM.
2 BED RM.
CORRIDOR
CORRIDOR
PORCH
BALCONY

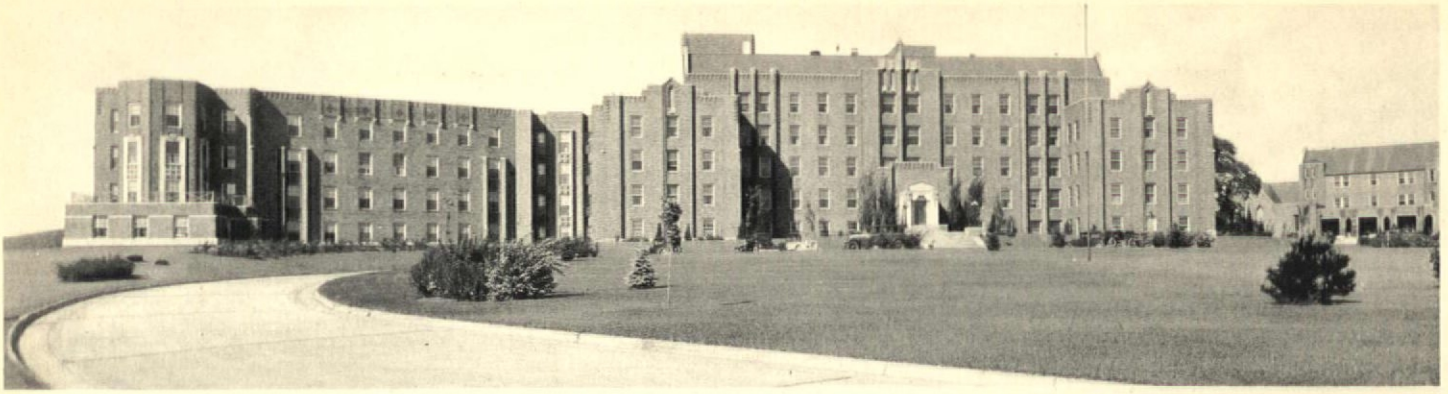

STACK
UPPER PART OF BOILER RM.
PORCH
CLASS RM
BED RM
TOILET
LIVING RM
NURSES CORRIDOR
CORRIDOR
ENTRANCE
MATRON BED RM
MATRON'S OFFICE
ISOLATION ROOM
ISOLATION CORRIDOR
HELPS ROOM
HELPS CORRIDOR
GARAGE
RECEIVING ENTRANCE
MALE HELPS LOCKER RM.
FEMALE HELPS LOCKER RM.
HELPS DINING RM.
SISTERS DINING RM.
NURSES DINING RM.
SERVING PANTRY
STAFF DINING RM.
CHAPEL
PRIESTS SACRISTY
NURSING SISTERS
STORE RM.
KITCHEN
DIET KITCHEN
LABORATORY
EMERGENCY OPERATING ROOM
DOCTORS
SUPT'S BED RM.
SUPT'S OFFICE
RECORD RM.
CORRIDOR
PRIESTS BED RM.
PRIESTS LIVING RM.
SPECIAL NURSES REST RM.
X-RAY ROOM
PHARMACY
RECEPTION ROOM
GENERAL OFFICE
TERRACE
LOBBY
VEST.
PONCA CITY HOSPITAL
PONCA CITY, OKLAHOMA.
SCHMIDT, GARDEN & ERIKSON - ARCHITECTS.
104 S. MICHIGAN AVE. CHICAGO, ILLINOIS.

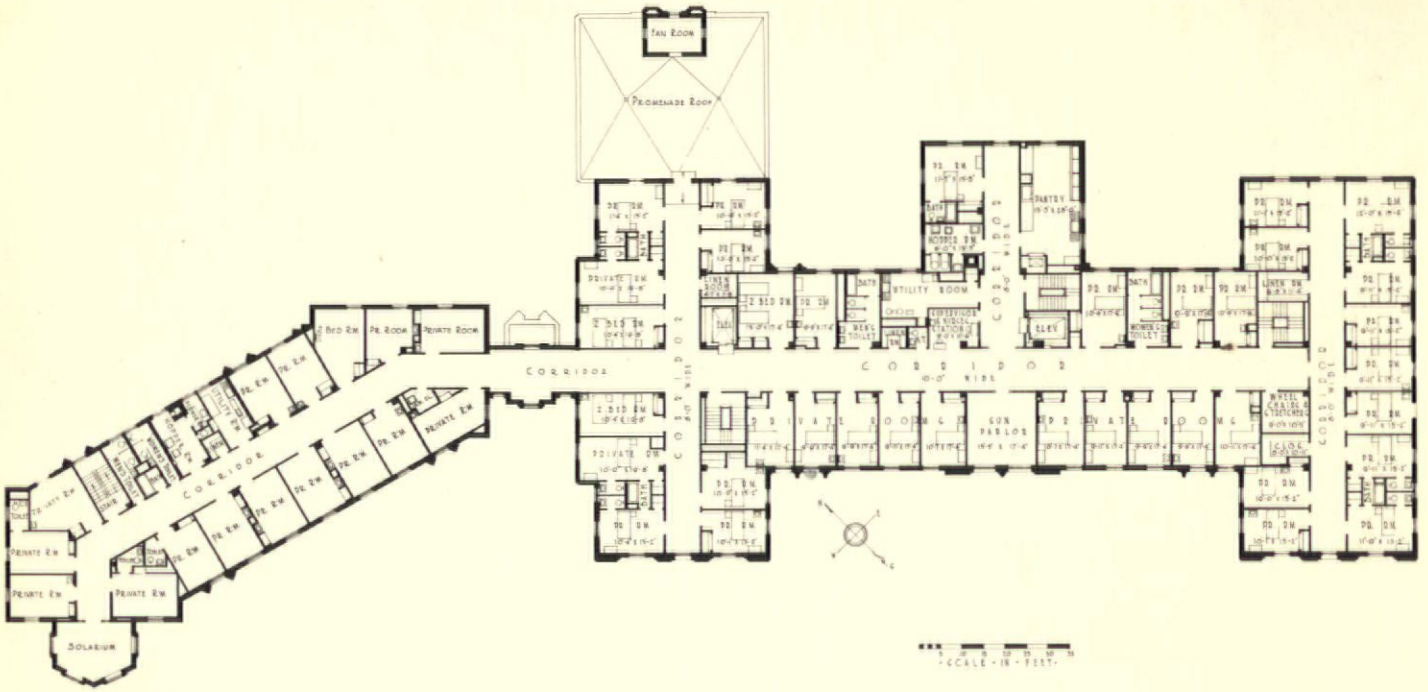


PONCA CITY HOSPITAL
OF THE SISTERS OF ST. JOSEPH,
PONCA CITY, OKLA.
SCHMIDT, GARDEN & ERIKSON, ARCHITECTS

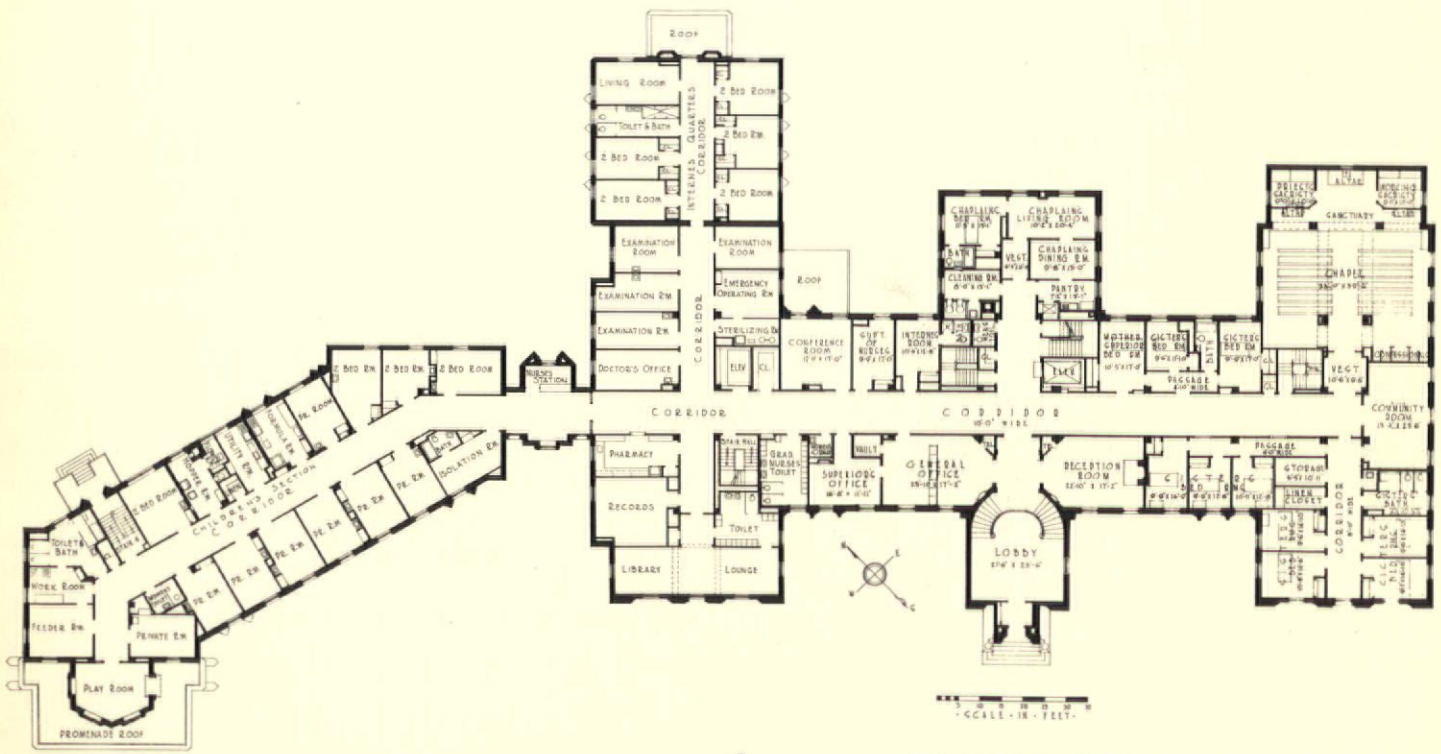
*It was required to provide all of the hospital facilities needed for the city, including the housing of the necessary personnel. Due to a limitation of funds, it was decided to provide facilities for 45 patients (not including nursery bassinettes) and 32 personnel. It was necessary to include two beds for communicable diseases. Provision was made for future growth up to at least 100 beds, the main building to be extended southwesterly.*

*The plans on the opposite page show the first and second floor plans. The hot westerly sun makes rooms on this side undesirable, but there is no serious objection to northerly rooms in this climate. The exterior is of stucco, with Bedford stone trim and variegated red tile roof. The floor construction is of concrete joists resting on wall-bearing tile. The heating is by gas*

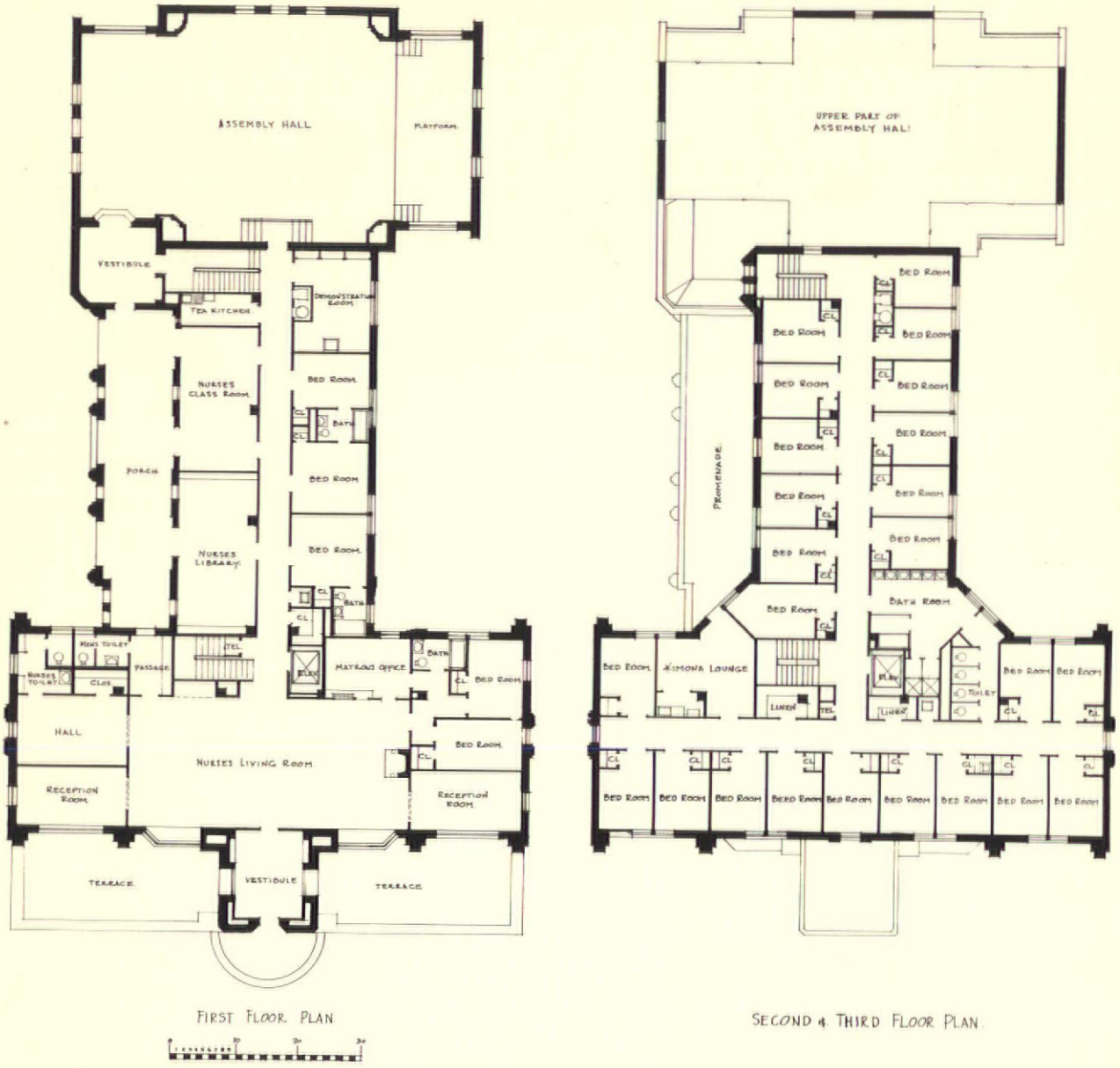





·THIRD · FLOOR · PLAN·




·FIRST·FLOOR·PLAN·




FIRST FLOOR PLAN

SECOND & THIRD FLOOR PLAN

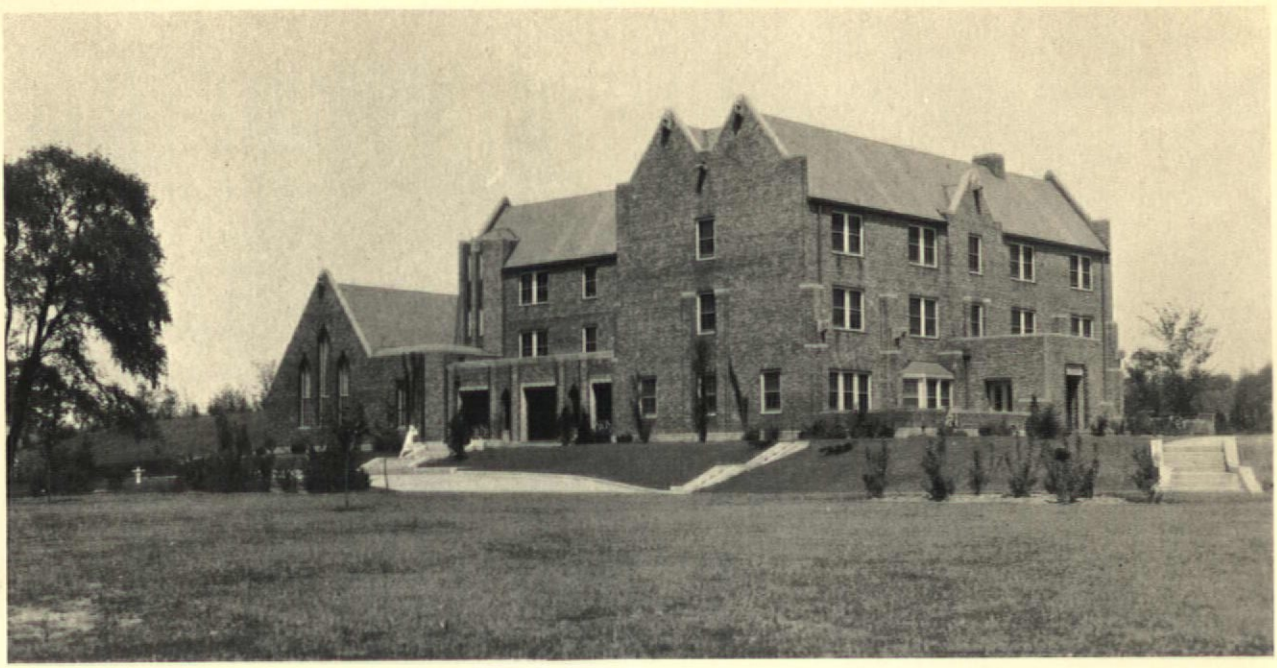
## Leila Y. Post Montgomery Hospital of the Sisters of Mercy and Werstein Nurses' Home, Battle Creek, Mich.

Schmidt, Garden & Erikson, Architects

*On the opposite page there is shown a general view of the hospital building, with the plans of the first and third floors. Provision is made for 118 patients, 12 Sisters, and 17 help in the main building, with accommodations in the Nurses' Home for 53.*

*In the hospital building the contents total is 1,065,403 cubic feet; power house and laundry, 70,000 cubic feet; the Nurses' Home, 273,500 cubic feet. The hospital is favored by a site of about 15 acres on the outskirts of Battle Creek, the land high and undulating. Toward the west is an attractive view over the main highway into a city park.*

*Variegated red brick and Bedford stone were used in the construction, slate for the roofs*



*Above, the Werstein Nurses' Home at Leila Y. Post Montgomery Hospital, Battle Creek, Mich.*

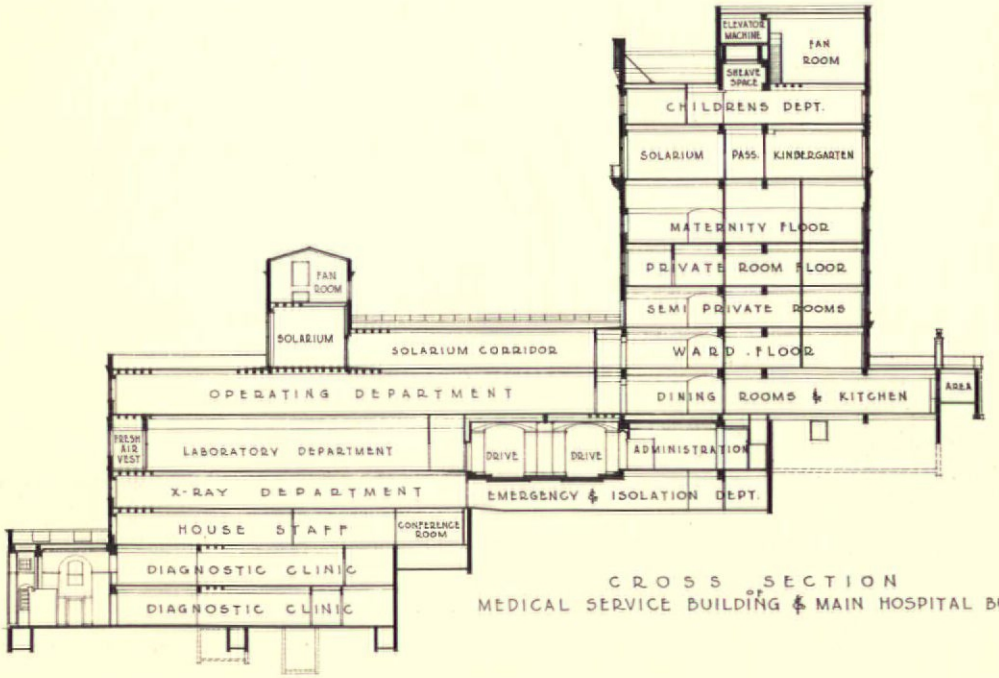
*Below, the auditorium in the Nurses' Home. Here the wainscoting is of light gray brick, the plaster very slightly mottled, and the woodwork birch, finished almost in its natural color*



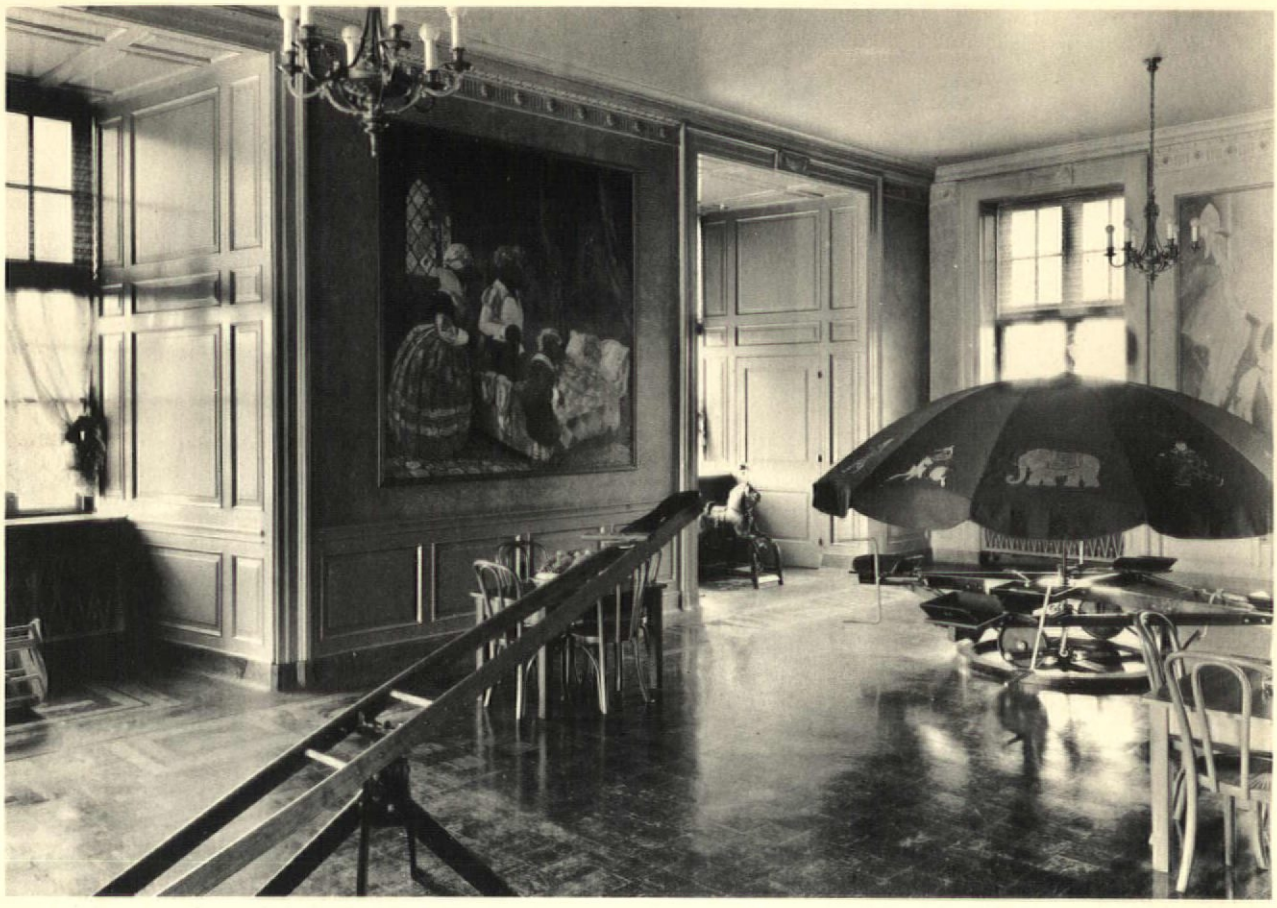


MONTEFIORE HOSPITAL, PITTSBURGH, PA.
SCHMIDT, GARDEN & ERIKSON, ARCHITECTS; HENRY HORNBOSTEL, CONSULTING ARCHITECT; S. S. GOLDWATER, M.D., HOSPITAL CONSULTANT

*The site is in the Schenley Park district, consisting of slightly more than 4½ acres on a typical Pittsburgh hillside. The immediate problem called for a hospital of 175 beds (exclusive of nursery bassinettes) that could be expanded to 200 or 225 beds in emergencies; housing for 12 internes; a large Out-patients Department, and housing of the necessary nurses. Future expansion is planned for a capacity of 400 to 500 beds*




CROSS SECTION
MEDICAL SERVICE BUILDING & MAIN HOSPITAL BUILDING

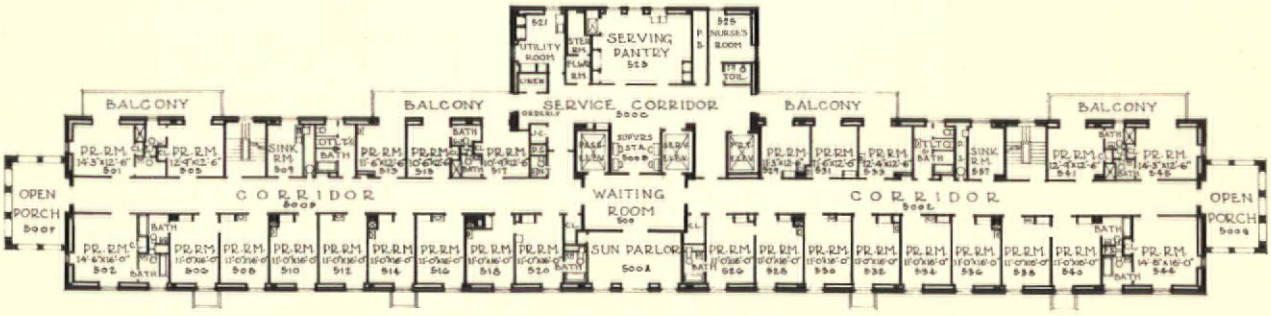


*The children's playroom on the seventh floor*

*From the lowest point on Fifth Avenue to the highest point on the site was approximately 80 feet. Ease of access for most of the out-patients dictated the location of the department close to Fifth Avenue. The in-patients' section was located at the top of the hill to avoid as far as possible the traffic on Fifth Avenue, and to secure the better outlook. These two distinct units were connected by a building containing the services used by both types of patients. Three residences existing on the site are used as temporary quarters for nurses.*

*The building contains 2,066,000 cubic feet, or 11,805 cubic feet per patient, and 10,989 cubic feet per bed. The large figure per patient is accounted for by the liberality of provisions in the Operating Department, X-ray, laboratories, etc., and by the large Out-patients Department*

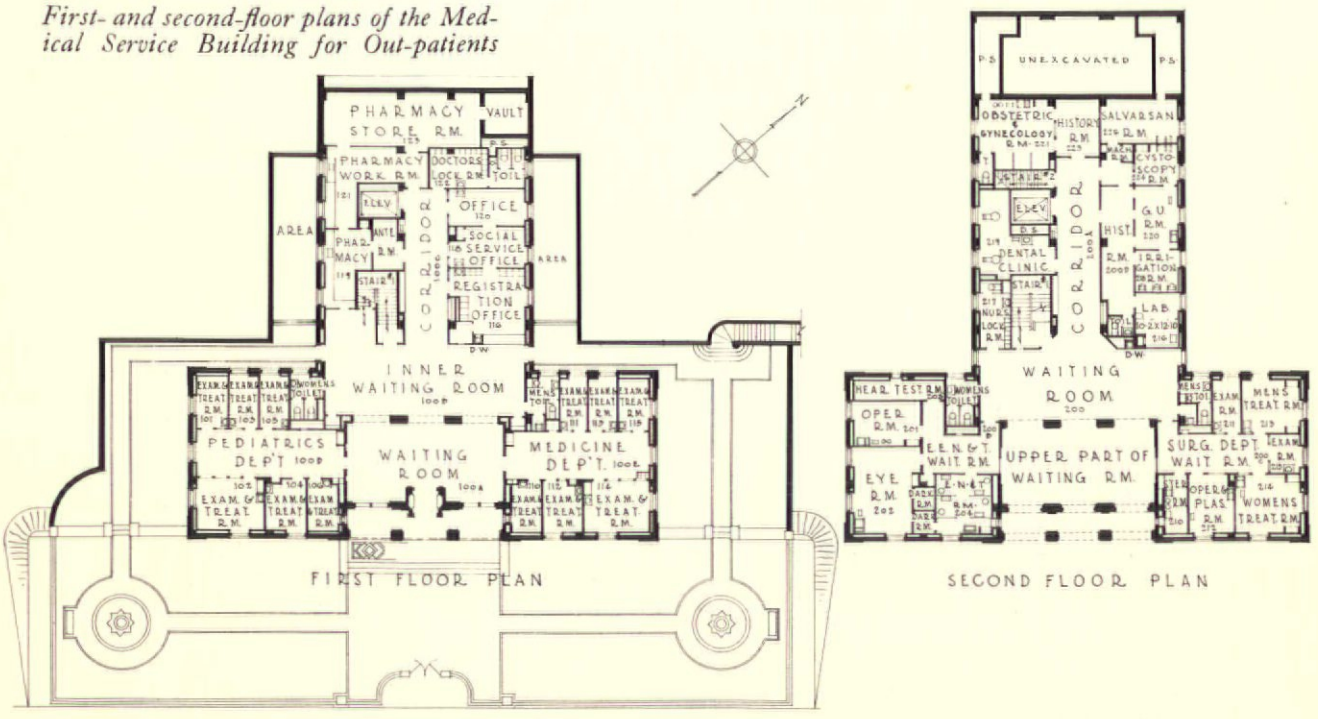
*Fifth floor plan of the main hospital building. The bottom of the plan faces southeast*





*The hospital from the east, a view which makes clear the abrupt changes in level*

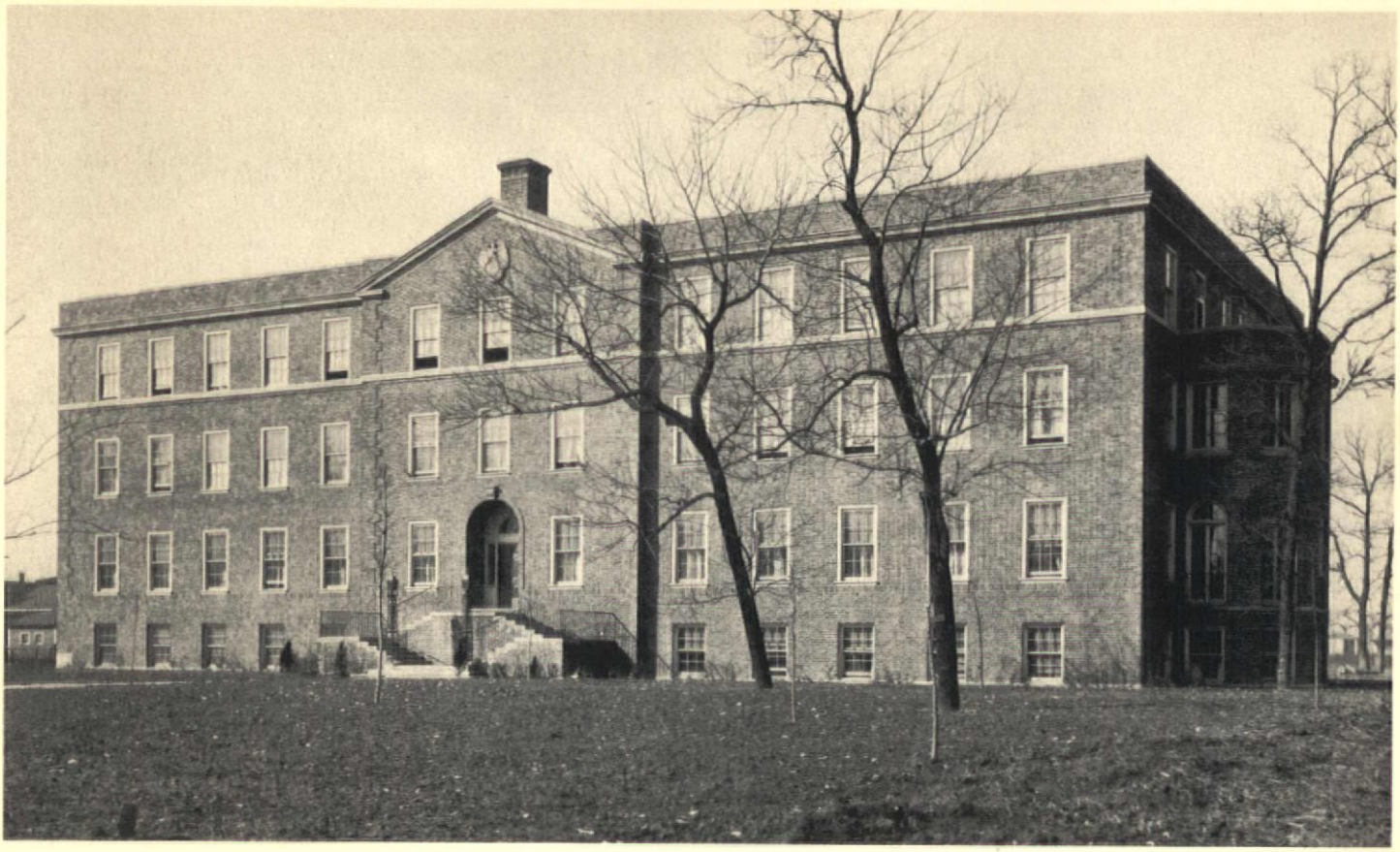
*First- and second-floor plans of the Medical Service Building for Out-patients*





*Above, the solarium lounge on the seventh floor of the main building.*
*Below, the Out-patients' Entrance on the lower, or Fifth Avenue side*





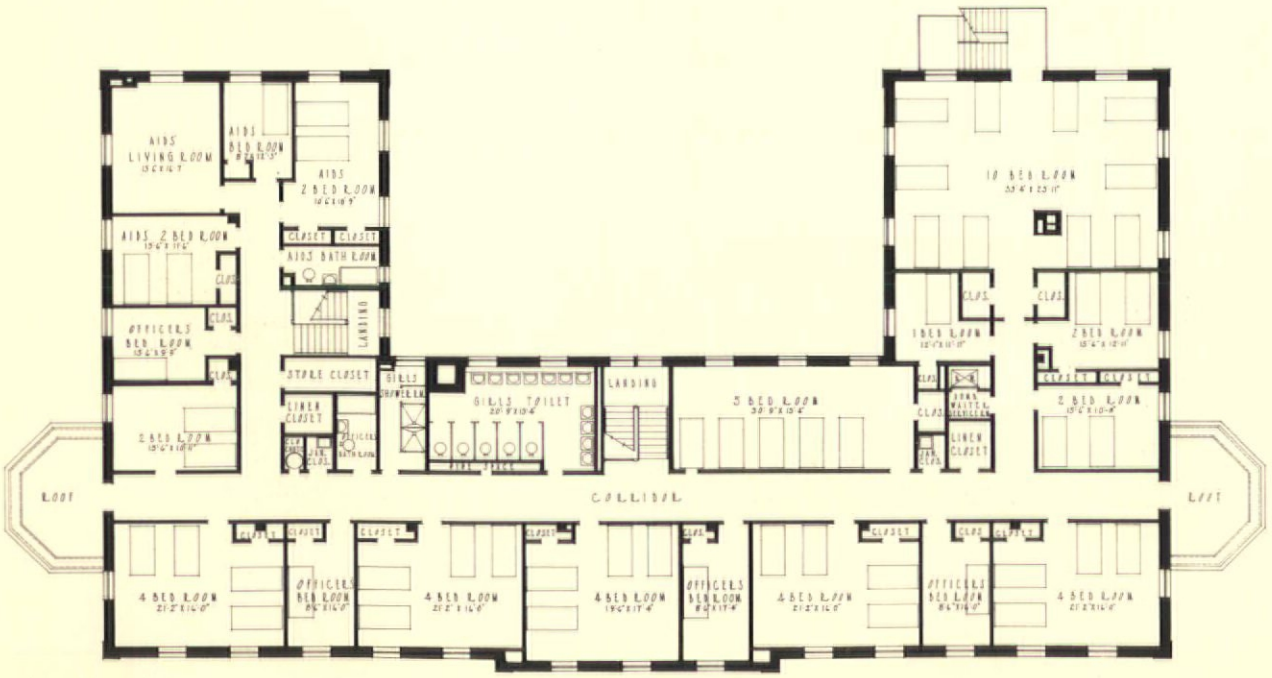
## Salvation Army Hospital for Women, Chicago, Ill.

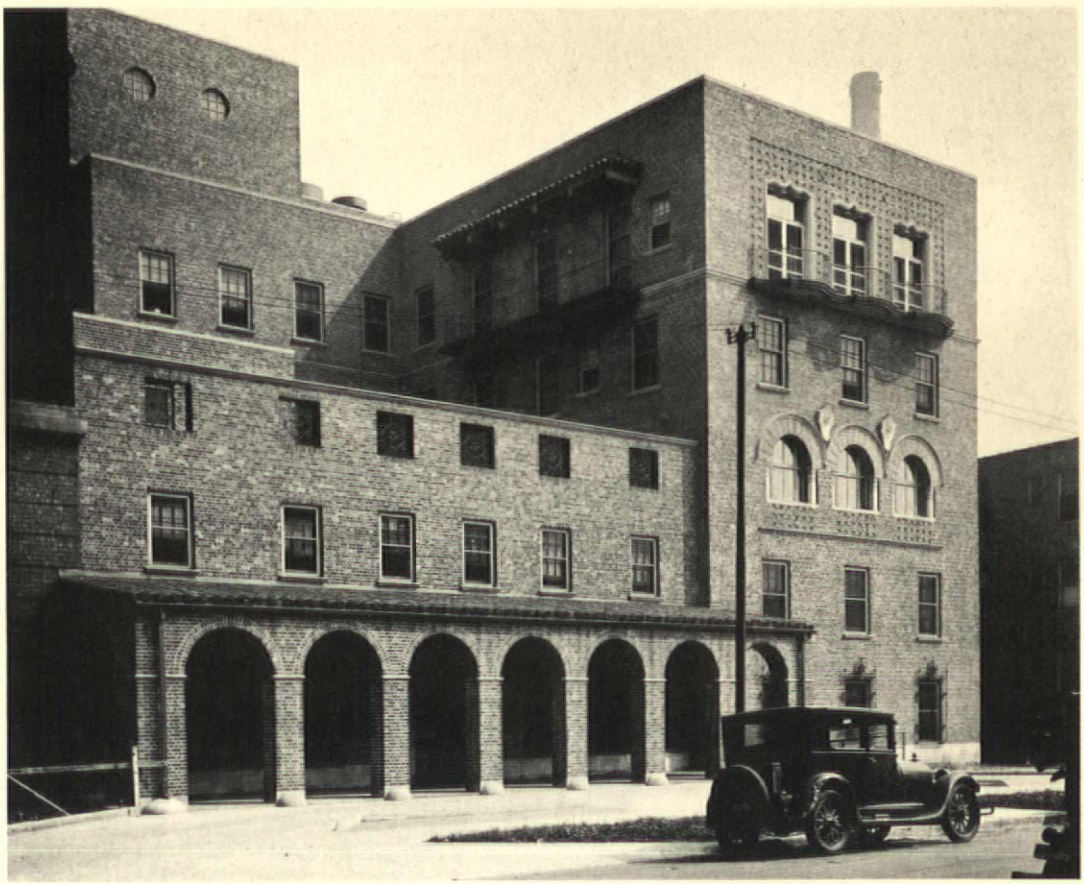
### Schmidt, Garden & Erikson, Architects

*The problem called for the construction of a building for the care of unmarried mothers before, during, and after the birth of the baby. Unlike the ordinary maternity hospital, the patients are sometimes residents here for some months, and, for the most part, are able to take care of themselves as well as of the babies. The building contains provisions for 70 patients, 15 personnel, and about 35 babies.*

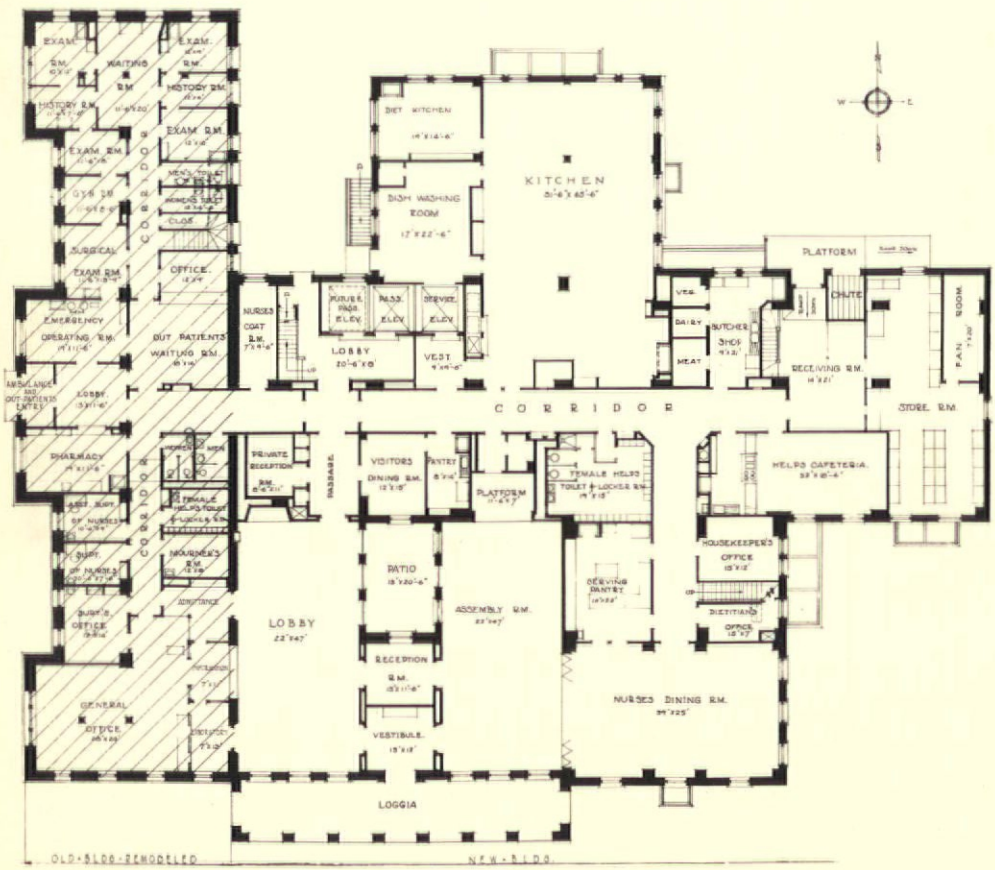
*The walls are of variegated red brick and Bedford stone, and the building contains 404,000 cubic feet. The cubic contents per patient is low, naturally—about 5,800 cubic feet; and still lower per bed (exclusive of the babies), less than 5,000 cubic feet. The cost was approximately $2,500 per patient bed, and somewhat over $2,000 for all beds.*

*Plan below is that of the third floor*





## Mount Sinai Hospital, Chicago, Ill.



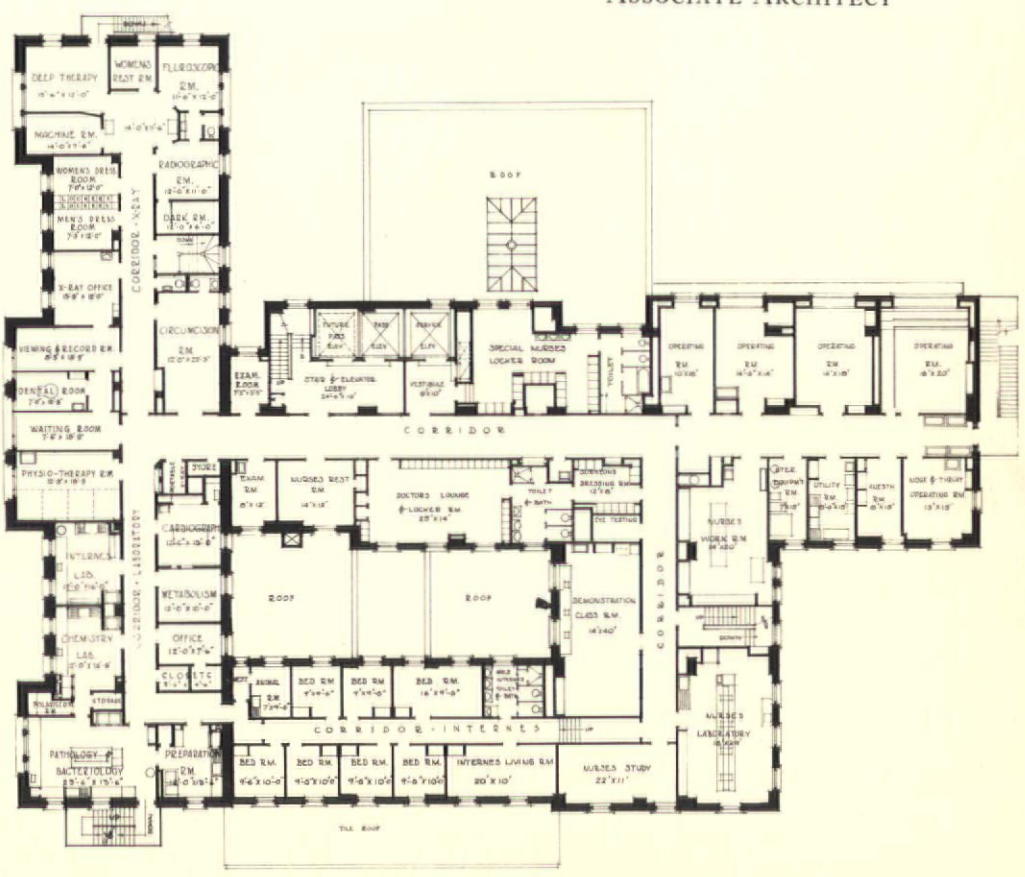

*There was an existing hospital building about ten years old (shown cross-hatched in the plan at left). This occupied the most desirable portion of the site. It was an expensive matter to remodel it, yet the values that remained were so great that the building could not be wrecked.*

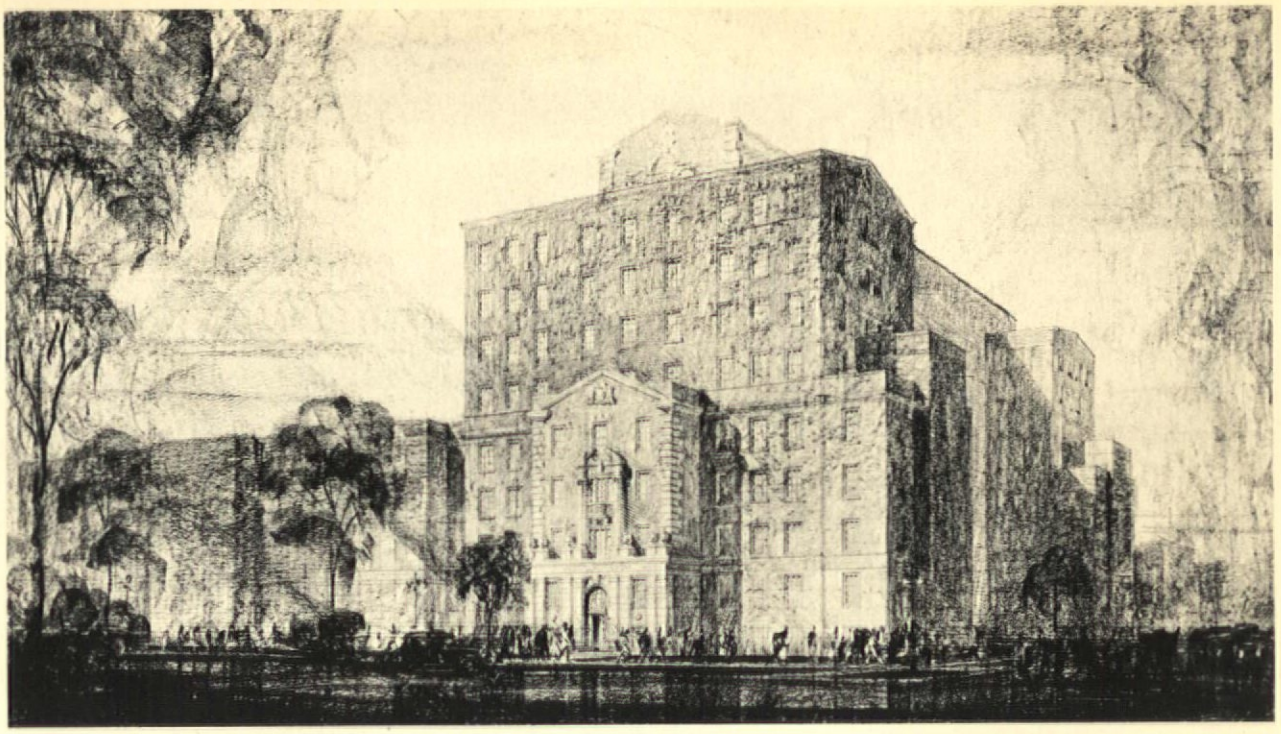
*The hospital was to be enlarged to a capacity of 150 beds, with housing for 8 internes. Eventual capacity was to be 300 to 400 beds, with provision for the housing of nurses. The illustration above shows the present stage of the project, provision having been made for the support of additional stories. Total cubic contents of main building, power house and laundry, and the old hospital, are 1,280,100 cubic feet, 8,530 cubic feet per patient, or 8,100 cubic feet per bed*




*At the top of the page is a perspective of the project as it is to be carried forward, and at the right, the first-floor plan (first floor above ground level). One of the most interesting features of the scheme lies in the relationship between departments on the ground floor (page 86) and the first floor, as it permits of the minimum of personnel and the maximum of control. Note the relationship between the Out-patients Department with the X-ray Department directly above it, and yet how closely this department is connected with the in-patients section by way of the first floor. The scheme is possibly only because the surgeons now recognize that they are no longer dependent upon daylight and the location of the operating rooms at the top of the building*

SCHMIDT, GARDEN & ERIKSON, ARCHITECTS; ALFRED S. ALSCHULER, ASSOCIATE ARCHITECT

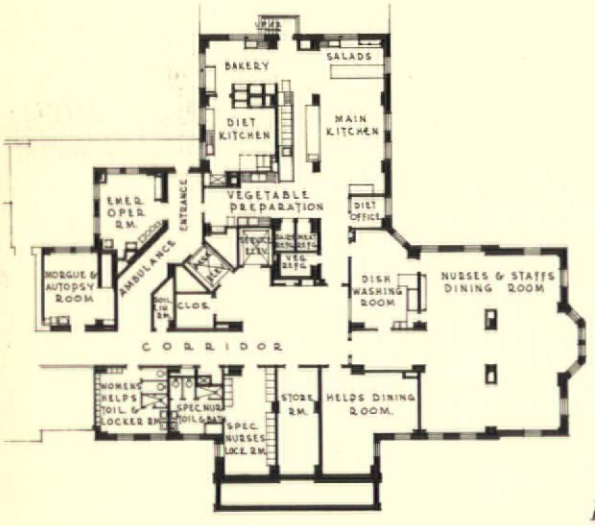


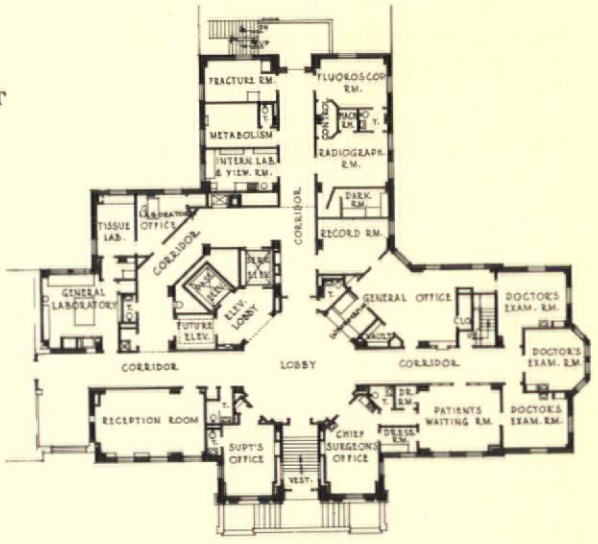


*The problem called for the addition of 50 private rooms to an existing hospital, with corresponding increase of all of the auxiliaries; future growth to envisage a possibility of 350 or 500 beds. This is one of the few cases in which provision for future expansion has been provided through construction strong enough to carry additional stories. Interesting features are the location of the nurses' station, and the relation of the serving pantry to the two wings and to the service elevators*

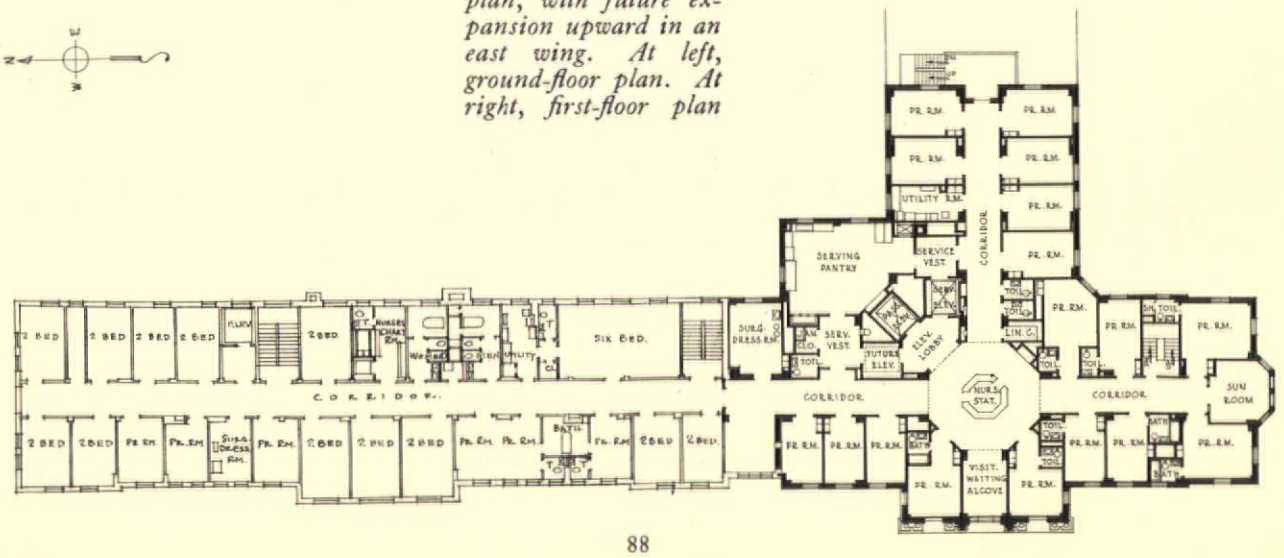
SWEDISH COVENANT HOSPITAL,
CHICAGO, ILL.

SCHMIDT, GARDEN & ERIKSON, ARCHITECTS




*Below, typical floor plan, with future expansion upward in an east wing. At left, ground-floor plan. At right, first-floor plan*





WASHINGTON HOSPITAL,
WASHINGTON, PA.

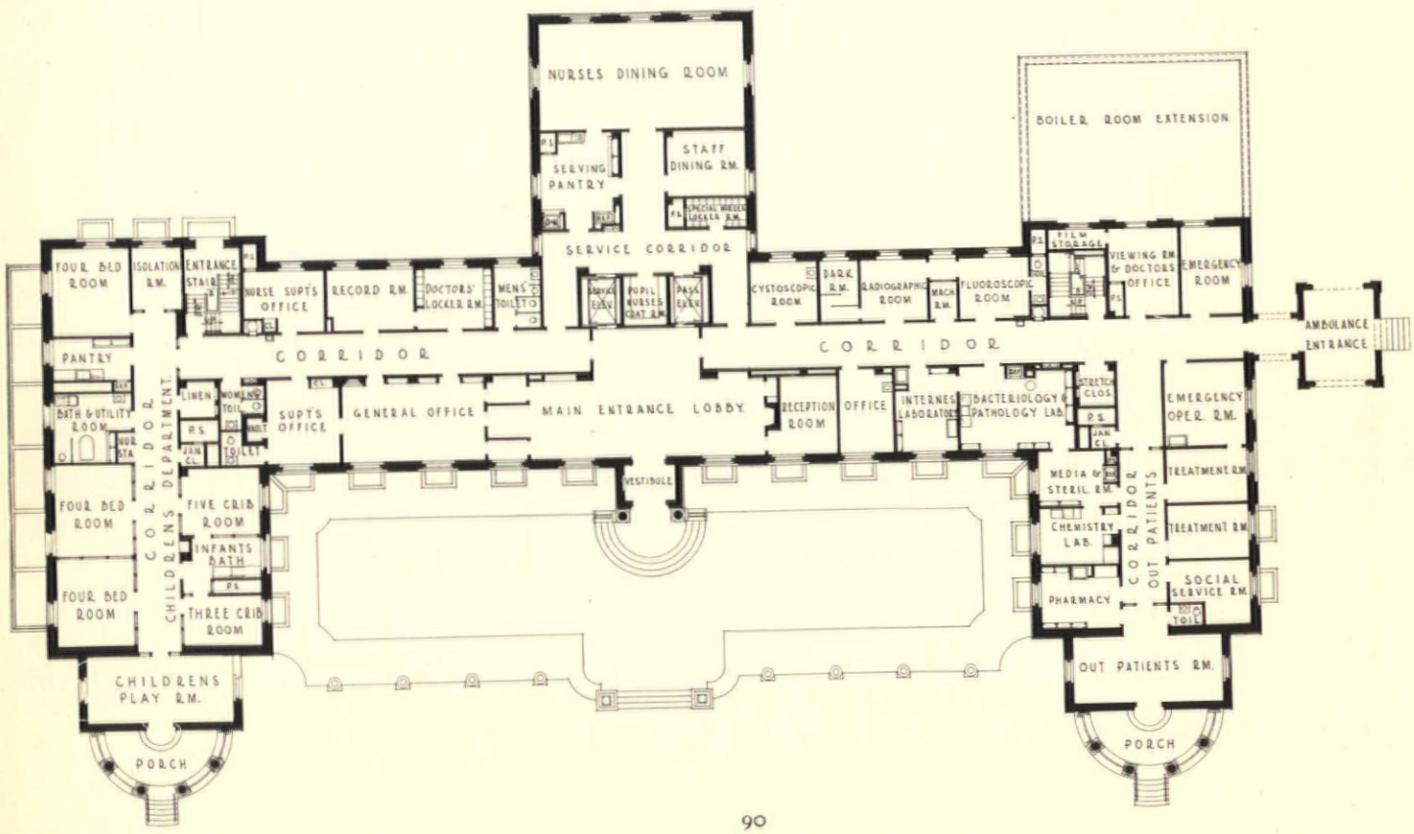
SCHMIDT, GARDEN & ERIKSON,
ARCHITECTS

*Above a general view of the hospital, which occupies a site of almost eight acres in the coal mining region. Architects who have not built in this locality may be interested to know that it is necessary to supplement the usual topographical survey with an under-ground survey, to make sure that there are no mines, active or abandoned, under the building.*

*As developed, the building contains 113 beds, with provisions to expand this to 150 beds in cases of emergency, by doubling up in the large single rooms and by using the solaria for patients*



*Above, an operating room in the Washington Hospital. Below, plan of the first floor, indicating the relationship of the Out-patients Department and the Children's Department in the wings, connected by the medical service*

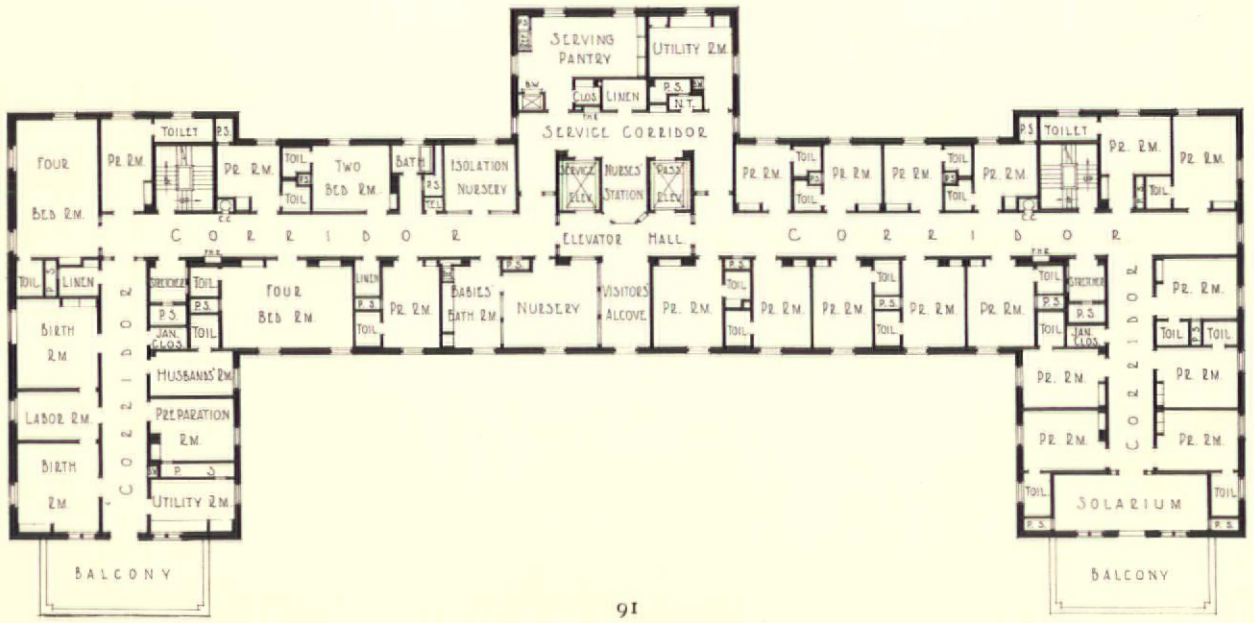


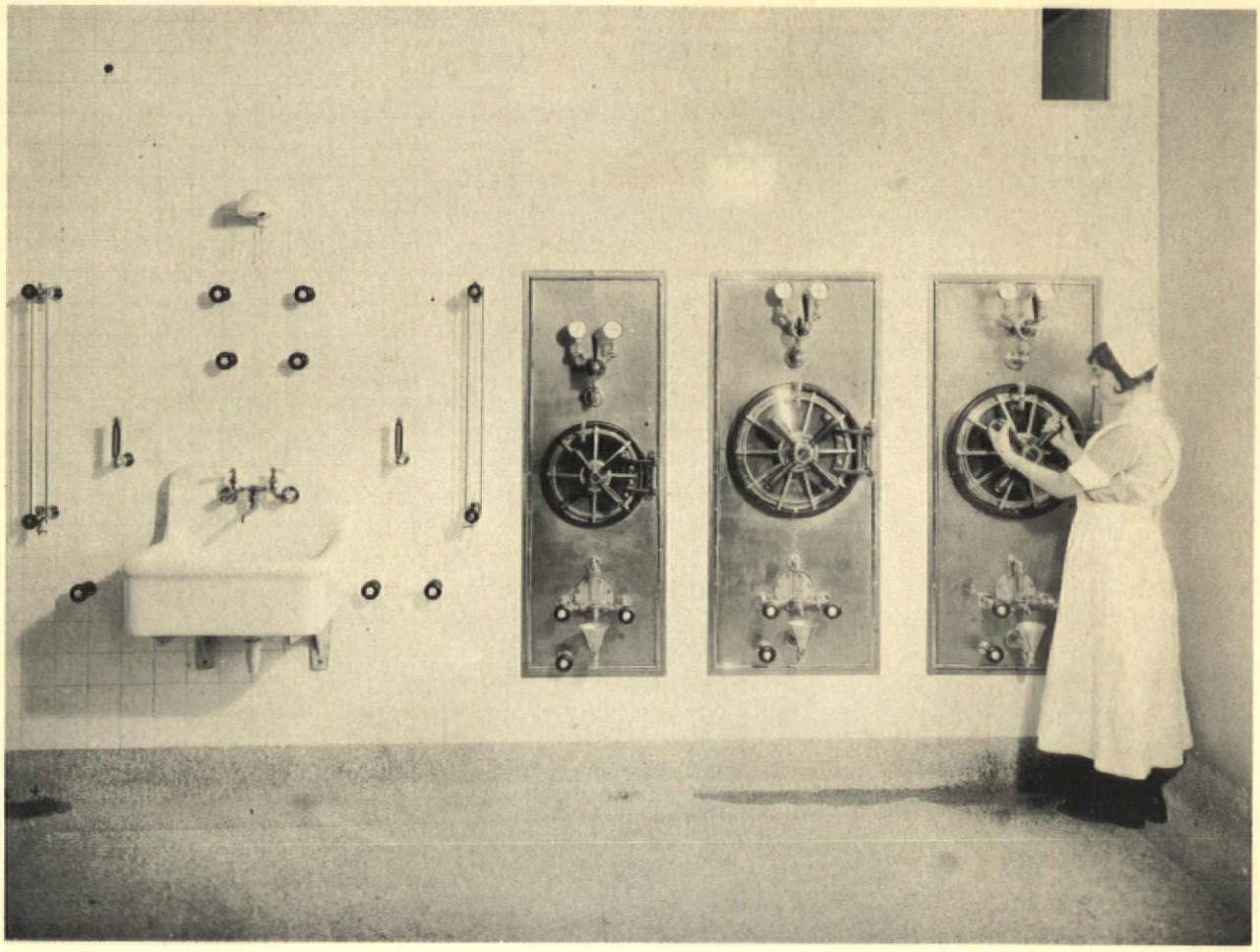


*Above, the entrance terrace of the Washington Hospital. The materials used for the exterior are variegated face brick with trim of Bedford stone.*

*Below, plan of the third floor. This is the first use, in the architects' practice, of the service corridor principle, which is also to be seen in the plans of Montefiore Hospital at Pittsburgh (page 82). The location of the laundry is in the basement under the left wing. The boiler room and machinery room are under the opposite wing, with the stack detached, as indicated on the first-floor plan.*

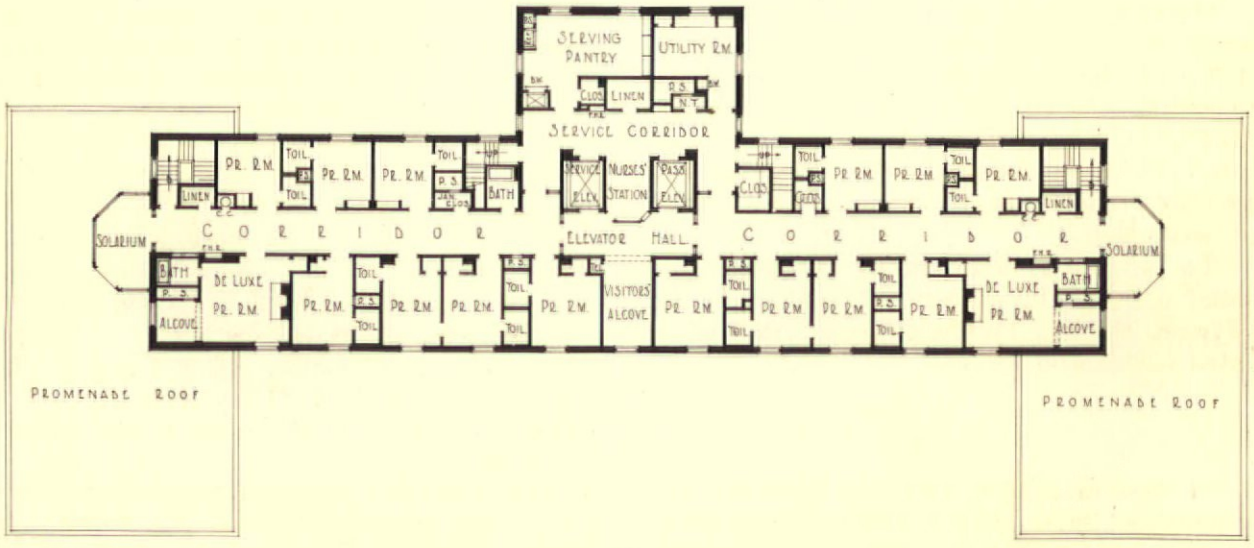
*Below, plan of the third floor. It is interesting to compare this with the plan of the fourth floor on the next page, indicating the setbacks at the ends*





*Above, sterilizer room in the Washington Hospital. Below, the plan of the fourth floor, with its solarium at either end of the corridor. Note the partitioning off of the elevator hall and the visitors' alcove, as well as the double access to elevator car, from both the hall and the service corridor.*

*The building contains 886,000 cubic feet; or 7,840 cubic feet per patient, and 7,560 cubic feet per bed. Provisions are made for ample future expansion*



# Material Vision

## LIGHT AND OPTICS AS THEY RELATE TO INTERIOR DESIGN

### *By Carleton B. Ryder*

"Thy dawn, O Ra, opens
the new horizon—
Men and their fates are
thine, in all their stations,
Their many languages, their
many colors——"

*Egyptian "Book of the Dead," translated by Robert Silliman Hillyer*

*Here is Mr. Ryder's third article dealing with what might be called organic structure. In December "The Neglected Sense" carried acoustics forward into æsthetics. Last month "Fair Weather" opened up a vista of possibilities in air conditioning. The present article deal with light, and a concluding installment will attempt a rational alignment of the various factors of the "human economy" in building.*—EDITOR.

THE plant patiently strains skyward. The spirals of the moth taper into the flame.

Man leans to light. Light shades his moods and bends his ways.

Is it because we, or the moth, or the plant, so desire? Perhaps, but such volition is obedient to the greater will of "Ra." Science believes that as the moth approaches the light one eye is first affected. A normal muscular balance is upset by the unequal stimulus. A greater muscular tension of the stimulated side causes the moth to turn lightward—thus strengthening the stimulus with mounting effect—to a fabled end. In various grades of complexity such a theory may apply to all life.

But man painstakingly tries to outwill Nature. Not very long ago, as time goes, we "came indoors." Darkness proving intolerable, we contrived a mimic sun. Today forty per cent of the people suffer disabled sight, although it is doubtful if there is a more stark disability than blindness. Our substitute sun was deficient.

We seek increase for freedom from Nature's bonds, but too often seek it arbitrarily. Denial of Nature increases latitude only by decreasing longevity. Our understanding of Nature must advance in step with our cunning if our purpose is not to be defeated. For "increase" follows *better adaptation to Nature, or applications of Naturalness.*

To be concise and orderly in treating so broad a field, this paper is divided into the Physical, the Psycho-Physiological and the inferred Conclusion phases.

#### THE PHYSICAL

Of those dispensing light and color, advised or innocent, there are none whom understanding does, or would not, otherwise than assist. It is essential to any great facility of usage.

Color may result from refraction and reflection whereby light is divided, as in the diffracting prism, into beams of its component wavelengths. Or color may result from "filtration," whereby certain beams are transmitted or reflected, and the rest disposed of through absorption or dissipation.

"White" light is a progressive band of wavelengths from approximately 4000 angstroms to 8000 angstroms. When we deal with colored light rays, we adopt the "additive" method. Thus, individual colored beams, converging on a single spot, add up to a produce "white" if they include a "white" light wavelength balance. Unbalance causes the spot to assume the color of the wavelengths predominating.

The "subtractive" method, a more usual means of color production, depends upon filtration. Thereby pigments reflect or transmit the desired hue and subtract the others from the incident light.

Many pigments, most notably the analines, reflect certain hues and transmit others simultaneously.

But pigments have limitations; their filtering action is only relative. It is subject to variation with the intensity of the incident light. Purity ensues when a pigment is subjected to that intensity at which filtration passes the greatest proportion of the desired hue and the smallest proportion of the undesired hues. This is the pigment's "saturation point." As the intensity decreases from this point, or the action is altered by adding black pigment, the capacity for passing the desired hue is fallen short of. These "shades" progressively darken to "black." As the intensity increases from the saturation point, or the action is altered by adding white pigment, the capacity for removing the undesired hues is exceeded. These "tints" progressively lighten to "white."

The saturation points of the various colors differ. The natural order of this "tone" or "value" difference proceeds from the maximum

brightness of yellow in both directions (around the spectrum) to the minimum brightness of purple.

Of such physical phenomena Nature has established an equilibrium of proportion and order. The single primary source is the sun, of intensities up to 10,000 foot-candles of a bright day. Diffusing property renders the atmosphere a secondary source, one of 2000 foot-candles intensity. This is a significant ratio. The composition of the radiant energy reaching us from these sources is definite. A specific proportion of Ultra Violets are present. Light from the primary source is "white," its component wavelengths predominantly yellow. The diffused secondary light is predominantly blue. With decreasing intensity, the peak of predominance tends toward the red end of the spectrum. The soil reflects the yellow-reds. Vegetation takes the yellow-blues from the soil, so reflects them from its foliage. This gives us the peaks of Nature's pigment balance. Only in her frivolous moments does Nature introduce pigmentary extremes, and these are equalized by intensities of light usually above the saturation point and subject to the Natural tonal balance that results from a single predominant light source.

### THE PSYCHO-PHYSIOLOGICAL

Evolution has fitted us for these ideals.

We are receptors of radiant energy. Not merely our organs of sensing respond, but our entire bodies, when, as matter, they absorb, dissipate, transmit, or reflect, radiant energy. It is probable that the totally blind do react to light, may be conscious of it and even to its direction. In this way direction and intensity of light may have effects additional to the visual, at least deserving of research. The eye employs its refracting media and structure to focus light on the retina. The adaptability of the eye is competent to do such tasks as Nature asks. But it constantly fails to meet Man's exaggerated demands.

Convergent adjustment for spatial fixation —the two-eyed vision such as we reproduce in the stereoscope—is suitable for distant vision but rapidly fatigues when its objective is as close as this page. Under high intensities, contraction of the iris confines the entering light to a pupillary area distinctly focussed, because combined sensitivity is greatest at the centre of the retina, or "fovea." Under intensities below twenty foot-candles the expansion of the retina admits a breadth of light beam in excess of the eye's ability to focus most definitely. This is heightened by the differences of focal length common to different colors. Attempts to focus contrasting colors simultaneously produce blurring known as chromatic aberration.

To the rare contrasts in Nature, evolution has responded by constructing the retina to respond to all colors at the fovea. Expanding therefrom, sensitivity drops off first for green, then, in order, for red, blue, yellow, and lastly white. Consistent with Nature's pigment balance, our eyes are least concerned over the most predominant hues; *but are most sensitive to, and soonest fatigued by, the hues that are extreme in Nature.*

Nature's own more or less horizontal plane of visual interest results in an angle of visibility not including the sun in its positions of greater intensity. Furthermore the eye has developed so that its blind spot (the entrance of the optic nerve), together with general decreased sensitivity to intensity, is in the lower part of the retina. Thus glare is minimized in Nature.

The last and one of the most important limitations of the eye is its comparatively low maximum speed of adaptation. It can be focussed not so very much faster than a camera. But, worst of all, when met with abnormal situations—such as some interior conditions—it takes hundreds of years to evolve response! And then distaste usually accompanies the effort. So we step from the physiological to the psychological, tracing the light stimulus through the neural channels that lead to the end of produced response. But preference, while it is a well-meaning indicator, is often misled by "relief" or pure, abstract "willfulness."

The general types of Psycho-physiological response may be divided as in the preceding article, "Fair Weather," namely, into the Functional, the Habitual, and the Illusional.

*The Functional.*—Discrimination favors high intensities of light, as is obvious from the preference for clear over cloudy weather. This discrimination extends to most all of the previously mentioned "ideals" of Nature. The order of preference places most tints before shades. Adherence to natural tonal order pleases, is called "congruous" or "harmonious." Departure from this order (as by associating a yellow shade and a purple tint) is termed "incongruous" or "inharmonious." This procedure, in restraint, has spice; it is irritating in excess.



*By courtesy of General Electric Company*

*A demonstration of the first psychological step away from window lighting. Both vertical and overhead sources, while retaining their conventional forms, closely approximate natural color and radiation balance, through wholly artificial means. Wanamaker's Philadelphia Store tea room; John T. Windrim, architect; The Voight Company, technicians*

Relief may invert the normal order of preference. Thus, to the tired eye, low intensities are preferable because essential to relaxation. Intensities below two or three foot-candles are actually sleep-conducive. Between such levels and the higher levels of efficient visual diligence the effect is conducive to visual recreation, or physical action. Similarly, "relief" is responsible for the psychologist's preference order of colors: red, blue, violet, green, orange, yellow. In this case we have been so long exposed to Nature's order that we fly to its reversal, but doubtless if the experiments whereby this order of preference was determined were continued for a period of time we should find the subjects glad to return to Nature's prescription.

*The Habitual.*—The complexity of this type of response is usually the result of its development in early life through post-natal association. Habits may arise from natural adaptation to arbitrary environment; some seem to have no better foundation than "willfulness." They are usually best appeased by subtle applications of Illusion, concealing the corrections.

*The Illusional.*—Habitual association is the palette, functional limitations the brush, of the Illusional response. The importance of visual illusion to all design cannot be understated. It can be used with startling success—or neglected with dismay. But since it is fundamentally an "abnormal," it must be used with caution, and is rarely justified to any great extent except for the correction of factual abnormalities, or habit pacification. The greatest care must always be taken that the illusion appeals consistently to the senses concerned.

The author viewed the McGraw-Hill Building, New York City, from 42nd Street and Broadway recently and noticed that the tower arising from the principal setback appears *wider at the top* in disconcerting conflict with the laws of perspective. His sobriety may be verified. The illusion is the result of vertical central lines bordered by short horizontal lines. When the arrangement is foreshortened the effect of divergence outweighs the convergence of perspective. A common characteristic of linear illusion is that it may not appear in

elevation or rendering, yet cries out in three dimensions!

Spatial illusions consequent upon chromatic aberration abound in the use of color. By nature the eye is nearsighted for blue and farsighted for red rays. The psychological tendency is to put such colors in their places.

The illusion termed "induction" is very common. Thence complementary colors are induced in neutral areas surrounding extremes. Portions of lighter areas immediately adjacent to darker areas are further lightened by induction. Thus the effects of contrasting combinations are heightened, and vice versa. Another illusional effect is for brilliant reds to take on halos of purple, and vice versa.

### CONCLUSIONS

The argument for Naturalness, supported by an understanding of such fundamentals as above outlined leads to unmistakable conclusions—a present vision of factual clarity and a bright vista beyond. Let us follow it through.

Our first and one of our most difficult tasks is to determine the line of distinction between visual diligence and relaxation. This distinction should be determined as exactly as possible. To place it empirically between the commercial and residential is altogether too crude; it should be located conditionally and temporally with respect to the occupant. It compels the conviction that visual *effort* should never be subordinated to visual *effect*. Our eyes are ready to say when and where the change should be, but we are schooled in ignoring their requests. It rests with the ophthalmologist to define the needs and with the interior designer to apply the definition, with us to realize the benefit.

To that end the interior designer should analyze the conditions *and the occupant*, reach his conclusion with the consultant, and then proceed, first, to supply illumination conforming to the visual task; second, to limit the occasion for visual work in conformity with the illumination; third, to ensure psychological fitness before imposing the conditions, and providing for a certain degree of their flexibility; and, fourth, perfecting the visual recreation.

With respect to the first of these, Intensity is the principal consideration. We have seen that the eye reaches functional efficiency at twenty foot-candles. This implies a somewhat higher general order of illumination than we are accustomed to, indoors.

It is often desirable to exceed the functional minimum of twenty foot-candles, under adaptational conditions. For instance, the usual rate of light decrease during the afternoon is too rapid for the eye to keep abreast of. Therefore, supplemental illumination might well be higher during waning daylight than is essential after dark. For the same reason interior illumination during daylight should be highest near entries and graduated progressively inward. The lighting of the Holland Vehicular Tunnel is a successful application of such practice. The same theory may be extended to the increase of supplemental illumination in office buildings before and after hours of exposure to high natural light. Such variation may be practically effected by controls of the photo-electric type, in conjunction with a timing control. Thus a means of insuring a constant level of light, in spite of natural fluctuations, with their certain disruptive results, is also provided.

The second step in the interior designer's procedure, limitation of the occasion for visual work in conformity with the illumination, is self-evident. It is primarily noted here to show the intricate inter-relationship between each phase of the interior structure, and should serve to remind the designer that the essential benefits to be derived from perfect relaxational lighting may be voided by the introduction of such a seemingly inconsequential factor as a bookcase. But further than this, the surest way to remove the probability of visual work is to present a means of substitute occupation, tactual or audible, accessible to the restless.

Third, let us see how our observations on fitness may be generalized and applied.

As to the source of light, if we wish to return to the eye its Natural domain, we should adopt a direct primary and indirect, or, at least, perfectly diffused, secondary source in a maximum ratio between primary and secondary of ten to one. Intensity reduction should likewise be largely confined to the former, its direction should be of single predominance, and its shifting not discernible.

We are thus placed at once in complete opposition to the prevailing "spotty" systems of lighting, with their complex divisions of attraction and sudden changes. We are offered the enticing prospect of having a dependable shadow direction and contrast ratio upon which to build our architectural and decorational scheme *without necessity of compromise*. Can this be possible?

The most difficult, but not insurmountable, obstacle is the window. Artificial light can be introduced through this source. It can be reflected with considerable inefficiency from the "transparent mirror" type of vision panel, but most practically it can be introduced by semi-indirect lighting troughs in close proximity to the window. However if, as we are rapidly and wisely tending, we decisively divorce the window's conflicting attributes, vision and illumination, by confining the former to quarters where there is something to be gained by looking out, we have obviated the difficulty in great part. The window is then to be considered, in the present writing, purely upon its merits as a vertical panel source of light. What, then, are such merits?

The panel system is at best a diffused direct source, but with insufficient diffusion to be an ideal secondary source. As a primary source the vertical panel is suitable at low relaxational lighting intensities. When the intensity is raised to diligence levels it will perforce become a well of glare from many positions within the room. Glare is not only painful to the eye but most uneconomical, since, by reduction of the pupil, it may waste a great part of the total illumination.

Glare from a high-intensity, direct, primary source can only be totally overcome by removing it from the visual angle, which is to say, placing it directly overhead—its most natural position. To gain such a result at all or many points in a room we must confine the rays to as nearly a vertical direction as possible. This is made feasible by utilization of vertical-vane assemblies, or by directional glasses and reflectors. They may be concentrated over locations of visual work, or be general, equally without glare or the disadvantages of multi-direction.

Naturalness for the secondary source then implies effective introduction over the maximum area at the minimum intensity. This is probably most readily accomplished by a totally indirect system reflected from ceiling and walls. As intensities are decreased for relaxational reasons, the primary source should first be cut, then diminution of the secondary source may progress from the ceiling downward upon the walls, but bearing in mind that the highest law in lighting is the ban on visible sources of concentrated light below the level of the eye.

As for light composition, fitness has specific implications. The primary source would thus naturally be "white" light of greatest proportionate intensity in the yellow wavelengths. This is reasonably close to the characteristics of the common incandescent filiment, possibly with slight blue-filter correction. The secondary source should be of somewhat more blue cast. With decreasing intensities the entire color balance should shade toward rosiness. Color in light is a thing to be tactfully used, indeed. There is no criterion in Nature for extensive use of any color, and no end to the psycho-physiological complications arising from such use. The intentionally "bizarre" may be achieved, but its desirability is the rare exception.

Light composition (as elsewhere mentioned) should include a definite, healthful quota of Ultra Violet radiation. The common electric lamp does not supply this, but bulbs of the available tungsten-electrode mercury-arc type do. This radiation may be controllable for high-intensity short exposure or, which is probably better, constant low intensity.

But in this latter type of lamp we find a close approximation of the bluish visible spectrum suitable for the above-discussed secondary source. To apply it in a totally indirect system requires that close attention be given to the reflecting surfaces, because few are efficient reflectors of Ultra Violet. Of these, white lead may be cited as one of the best pigments, and chromium and aluminum as the better metals. The last may be applied in leaf or paint form, and if decoration is overlaid, it should be of as high a coefficient of Ultra Violet transmission as possible.

This line of reasoning leads the writer to a path not immediately open, but nevertheless irresistible: to overcome the disadvantages of concentration common to the incandescent filament, effect perfect diffusion, and obtain it more economically than by reflection, by means of a plausible development—the fluorescent surface excited by invisible Ultra Violets.

Our discussion of pigmentary fitness needs no elaboration to show the evidently natural methods of application. We have every assurance that the most "livable" schemes are those adhering to Nature's practice. Nor should we fear closer approach to the maximum purity or saturation of such colors, especially if we subject them to tint-inducing high intensities and the tendency toward natural tone order that follows from a single predominant source.

But for all this we are still confronted with

what may be termed the need for visual recreation—as distinctly more purely psychological than the need for relaxation. Visual diligence finds itself at home in the yellows, and relaxation seeks the greens. But recreation demands extremes, both of color and contrast, of specifically short duration, or small expanse. The ramifications of this subject into balance, form, line and mass, as well as color, cannot be touched upon here. Co-ordination of this extensive and delicate psychological field is yet in its infancy.

A notable development in this line is the "Clavilux" or color organ, as contrived by the artist, Thomas Wilfred, whose object it is to sway the sensibilities through play of light. The conclusion of first interest to this article is that mobility as well as form are indispensable adjuncts to color for achieving material effects. Mobility being in a certain sense the reciprocal of time, or temporal change, the findings of Mr. Wilfred return us again to the fundamental of specifically short duration for optical recreation. Although granting mobility to the eye renders smallness of contrast a means of obtaining the same end, it is still a much less precise means than temporal change.

In summary, the inference is that a complete change of interior design and color scheme, controlled temporally or at will and for brief intervals, would be ideal. Such a system has been and can be evolved through decoration purely by light, as with projecting apparatus of the "Clavilux" type equipped with "records." But decoration by light should be far removed from any conflict with illumination—and kept there.

Although we should find ourselves able to return sleep to the insomniac, digestion to the dyspeptic, and insure our children's right to sound eyes by straightforward application of improved lighting principles, we should still meet the hecklers, typical of the habitual response. To these the answer is a silent application of persuasive psychology, which is neither a remote nor a very difficult task. Departure from custom for closer approach to Naturalness is seldom hard to reconcile.

And yet, with so much at our finger tips, we shall not grasp it until we have accomplished the co-operation of psychologist, physiologist, engineer, and designer—and until we have realized the equal importance of each. To quote Doctor C. E. Ferree, eminent ophthalmologist, in a communication to the writer, "Until the forces which contribute to the entire housing are better aligned, we shall not have comfortable and attractive places in which to work and live." In the light of its importance this opinion cannot be too emphatically advanced.

We have seen the productive economy of advanced lighting practice. Is not human economy the *quantum sufficit* for another stride?

## BIBLIOGRAPHY

*(With acknowledgments for much of the foregoing)*

*Light and Health*, M. Luckiesh and A. J. Pacini. Williams & Wilkins, publishers, Baltimore, 1926.
*Artificial Sunlight*, M. Luckiesh. D. Van Nostrand Co., New York, 1930.
*Seeing*, M. Luckiesh, F. K. Moss. Williams & Wilkins, Baltimore, 1931.
*Color and Its Applications*, M. Luckiesh. D. Van Nostrand, New York, 1927.
*Color in Interior Decoration*, J. M. Holmes. Charles Scribner's Sons, New York, 1932.
*The Language of Colors*, M. Luckiesh. D. Van Nostrand, New York.
*Visual Illusions*, M. Luckiesh. D. Van Nostrand, New York.
*Light in Architecture and Decoration*. Illuminating Engineering Society. New York City, 1932.
*Light and Architecture*, H. E. D'Andrade; *Lighting*, May, July, October, 1931.
*The Engineering Features of Built-In Lighting*, A. L. Powell, and Alston Rogers; Nov., Dec., 1930; Jan., 1931.
*Lighting and the Hygiene of the Eye*, C. F. Ferree, Gertrude Rand; *Archives of Ophthalmology*, pp. 1–26, *2*, 1929.
*The Problem of Late Afternoon Lighting*, C. E. Ferree, G. Rand, *Archives of Ophthalmology*, pp. 558–575, *7*, 1932.
*Visibility of Objects as Affected by Color and Composition of Light*, Parts I, II; C. E. Ferree, G. Rand, *Personal Journal*, Vol. LX, No. 6; Vol. X, No. 2.
*The Use of Ultra Violet Sources for General Illumination of Interiors*, A. D. Oday, L. C. Porter, *Transactions Illum. Eng. Soc.*, No. 10, 1932.
*Luminous Architectural Elements*, W. M. Potter, Phelps Meaker; *Transactions Illum. Eng. Soc.*, No. 4, 1932.
*Recommended Foot Candles*, M. Luckiesh, F. K. Moss; *Transactions Illum. Eng. Soc.*, No. 11, 1931.

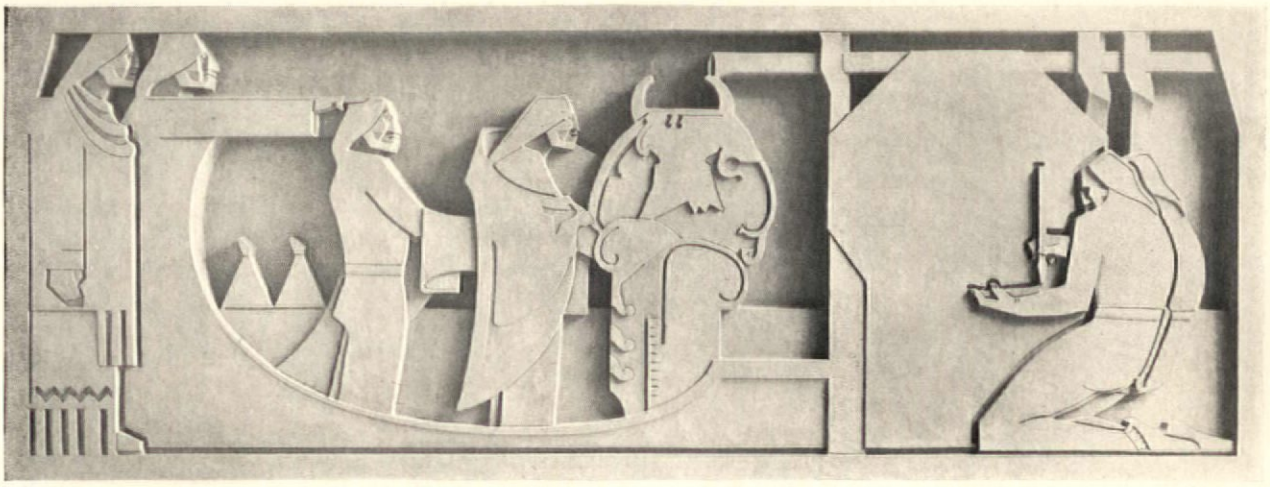
OTHER AUTHORS

P. W. Cobb, C.-E. A. Winslow, L. Greenburg, E. W. Beggs, C. S. Woodside, W. N. Goodwin, Jr., E. B. Titchener, J. F. Dashiell, L. T. Troland, A. I. Gates.

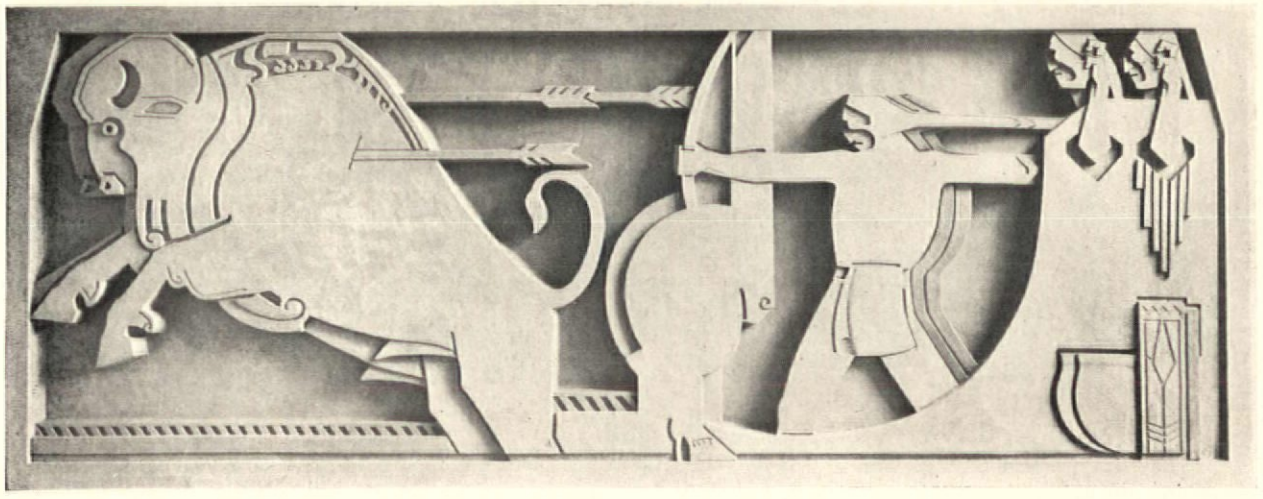



*John David Brcin, sculptor, in collaboration with John and Alan McDonald, architects, has carved sparingly in the pink Georgia marble of Omaha's Joslyn Memorial some integral decoration and several panels symbolizing the Early West (overleaf). The masks in the circles are of the Trapper and the Plowman*

# Sculpture on the Joslyn Memorial, Omaha, Neb.



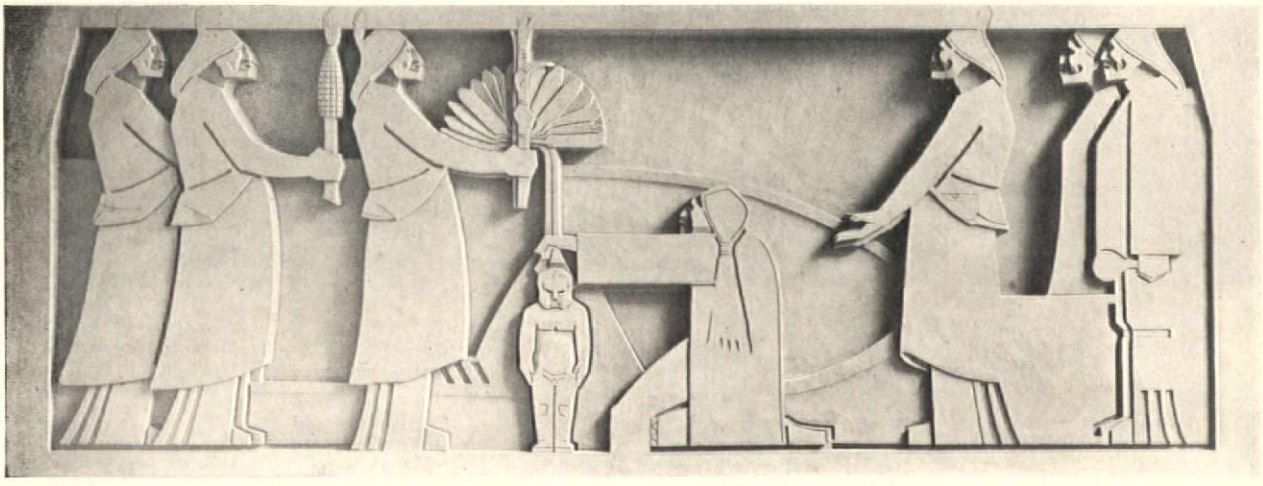
*"Indian Picture Writing"*



*"Sign Language"*

JOHN DAVID BRCIN, SCULPTOR

*"Prayer for Life"*



# Some Pitfalls in Supervision

## By W. F. Bartels

XXVIII. HARDWARE

(*CONTINUED*)

DOOR butts should be of adequate size and number. The superintendent should carefully check these items and also make sure that they are of the material specified. Here again the magnet may prove to be a discerning helpmate in the detection of the metal. Also, a file is a very revealing instrument to have around when testing hardware. It may also be found that two pairs of butts are being used in place of the three called for, and even the two are not the type specified. Doors subjected to extemely hard usage should have the hinges bolted where possible. In the use of invisible hinges care should be exercised to see that the correct size and proper number are used. If a door so hinged should sag because of poor or inadequate hinges the whole purpose of their use would be defeated. The application of olive butts should be carefully overseen. These butts (so called because of their resemblance to an olive) are not easy to install. If not properly adjusted (*i. e.*, a true bearing obtained on each one where two are used) the door is apt to swing open or shut when left to its own devices.

The installation of hardware, though relatively simple and requiring very little thought, is often most successfully bungled. Butts with loose pins are hung with the pin on the exterior, or on the public-hall side of an apartment door. Left-hand locks are installed on the right-hand doors with the result that they do not catch. Neither screen-door hardware nor any other kind should be allowed to be installed so close to the outer edge of the door stile that the hand may be pinched between the knob and the jamb of the door.

Cheating on the grade or type of metal is one of the most common pastimes in the hardware business. Passing off plated ware for the genuine cast material should not "get by" any superintendent familiar with the use of file and magnet. As a rule stamped goods are easily distinguished by the feeling or light weight. Various other items must be checked—foot and head bolts on doors must have receiving plates or "keepers," and the holes in them must be cut out. Often the holes are not made and even the plates are left off. Window lifts should be large enough so that a good purchase may be obtained to open the window. Window catches should be so installed that when the window is locked both parts of the catch fit snugly and cannot be jarred open by shaking the window.

Besides fitting tightly in their mortises, locks should have the strike plates well secured. Then too, the centre of the lock bolt should be the centre of its hole in the strike plate. Then if any slight settling in the building occurs it will not necessitate changing the strike plate, with the resulting disfigurement of the trim. Keys should not only be furnished for their respective locks, but should actually operate these locks. Many a tenant has moved in an apartment only to find that the keys inserted in the locks of interior doors were only ornaments.

Knobs should be tight and securely fastened. If not of the screw shank type, washers should pack the knob so that it will not be loose and rattle. One contractor about to put the finishing touches to a house found the screw holes in the shanks of the knobs not the proper size for the door. This he remedied by cutting off the shank and wedging the other knob on. The screw hole he fixed by cutting off the head of the screw and gluing it in the hole. This job probably would last until the owner moved in or an over-ambitious person gave the knob a good pull.

All doors should be checked to see that the hinges are properly set. No door should swing shut of its own accord unless it has a door check. Nor should any makeshifts be allowed to substitute for good workmanship. Sometimes if the butts have been set too deep, or the strike-plate hole is too high for the lock bolt, a heavy thumb tack or other unobtrusive object will be set just below the lower hinge. Doing this will throw the opposite side of the door upward, thus making the lock work and the door close. With all these subterfuges, it will be seen that the superintendent must not feel content just because in the specification it says, "hardware to be chosen by the architect," but must realize that he has to be more up on his toes than ever when such a phrase is encountered.

## ROOFING *and* SHEET METAL

MANY newspapers and magazines have "Building Departments" in which various questions appear pertaining to the repair and upkeep of the home. If the architect and superintendent would peruse these they would see entirely too large a percentage asking: "What can I do to make my cellar dry and habitable?" or, "Why should every heavy rain make my cellar wet," and so on until one might believe all cellars to be wet and damp in and out of season. The questions, however, make one feel sorry for these owners—and for the superintendent (if there was one). In most cases it is probable that a faulty condition cannot be remedied without considerable expense. The cost of insuring cellars being dry at the time the house was being constructed is insignificant compared to the amount required later to accomplish this purpose. In most cases there is no excuse for a wet cellar. The architect should make provision for building a dry cellar and the superintendent should see that these provisions are strictly carried out.

No matter what the method of waterproofing employed, there is no excuse for not seeing that it is properly carried out. Where water pressure develops, and it does with serious frequency, there must be reinforcing to guard against it. Sometimes this matter is not given enough thought. Floors and walls may be made waterproof by a variety of methods. Sometimes materials are added to the concrete mix. Sometimes a felt well bedded in a good grade of pitch is put on the outside of the wall. But either method must be well executed.

Imagine the plight of a commuter summoned home with the admonition to hurry because his house was falling down. He hurried home dismayed to find that his cellar floor was developing huge waves in it. This was poor consolation even though he realized that the house itself was not going to fall down, at least not at that very moment. An expert superintendent was summoned, but at first was able to give no explanation. If there was a good waterproofing beneath a properly reinforced slab, what could the trouble be? The answer could only be found by digging up the concrete floor. The waterproofing was in excellent condition and so was the concrete, despite the fact that it was cracked. *But* the reinforcing in the concrete had been put in "upside down," as it were. Instead of the reinforcing being in the top of the slab where it belonged, it was put at the bottom just as in an ordinary above-ground floor slab. No one had reasoned out that the pressure would be up and not down.

The waterproof coating of walls must be carefully applied. The entire job is rendered vulnerable by faulty application, or the damaging of one small section through which the water can work its way. All edges of fabric must be lapped and joined. Pitch pockets are to be avoided wherever possible. Great care must be taken with the waterproofing immediately after it is applied so that nothing harms it. The necessary protective covering must be provided as soon as possible.

For the small house in the country the waterproofing should be brought up above grade or to the first floor. In the city building it is brought up above the sidewalk level. If there is a sidewalk vault, it is carried under the sidewalk over the vault and fastened to the flashing of the building. A leak will often travel thirty or forty feet before making its appearance inside the building, and it costs a pretty penny to hunt for it when tearing up the sidewalk is involved.

There are hundreds of types of roofs but almost more important than the quality of the roofing is the quality of the workmanship. The best roofing material ever made can be spoiled by poor laying. Experience is a necessary qualification for a roofing contractor, but neither it nor the loud proclamation that he has been forty years in the business, will automatically result in a good job. This type of contractor generally has a subordinate who attends to the work, and the superintendent who lets any roofer not personally known to him go about his business without supervision will rue the day that he did so. It is far better for the superintendent to spend a little extra time insisting on a good job than to lie awake nights later, wondering just where the many leaks are coming from.

(*To be continued*)

# The Editor's Diary

*Monday, November 28.*—Dropped in to see Henry Wright who sails tomorrow night for Europe where he is to spend a few months checking up, with the results abroad, his own findings regarding housing problems.

*Wednesday, November 30.*—Walked up from The League after lunch with Robert Kohn, he telling me something of his proposed school for qualified architects who want to be brought up to date in the matter of housing. It is possible that the school will open next spring here in New York with lectures and instruction by Henry Wright, Clarence Stein, Frederick L. Ackerman, and others, to distribute among those in the profession who are interested and qualified, the data that the last few years' experience and research have brought out. Most architects who attempt extensive low-cost housing in these days will find themselves as unfitted to cope with the problem as they would be unfitted to perform an appendix operation. It is of the utmost importance, now that housing looms ahead of us as the architect's greatest task, to avoid the errors and waste that our advanced knowledge makes clear.

The Society of Beaux-Arts Architects held its annual dinner this evening at the Institute of Design. Aside from some discussion as to what would constitute proper attire at the coming Beaux-Arts Ball, and the re-election of Arthur Ware as president, much of the evening was taken up by George Chappell (Doctor Walter Traprock) who, with the aid of six fish bowls containing colored water, four sausages, three pears, a wooden door and some silk ribbon, carried on a medical analysis of leading artists in the United States. With the apparatus mentioned, and several charts, he discussed the blood pressure, water pressure, height, length, mental and vegetable capacity of his subjects.

*Thursday, December 1.*—Speaking of blighted city centres, there are numerous perennial plants that in the course of time begin to decay at the centre of the clump, and find new life by expansion on the perimeter. Finally the old clump has to be lifted, divided, and re-established. Our larger cities seem to have been doing pretty much the same thing. At the recent National Conference on City Planning in Pittsburgh, the significant conclusion of the whole affair was expressed very clearly by Harland Bartholomew. Vague ideas as to how we may produce a city beautiful will get us nowhere. What we have got to do is to bring together the facts as to changing quantities and locations of population over a considerable period in the past, so that we may plot the probable growth in the future; what that population is and does, and finally where that population should be disposed within a comfortable area for the best interests of all. We shall find probably that with the slowing up of population growth our cities are too big, rather than too small, and crowded because of haphazard, unconsidered growth. We shall have to reconstruct the crowded centres. It is more than likely that in redisposing city populations in more logical grouping and housing, we shall find that public utilities in the outskirts, winding through grass-grown streets of further planned subdivisions, may be abandoned or possibly torn up to salvage what remains good in them.

If we could examine without prejudice the actual assessment values of our blighted centres, without prejudice either as to what they were once or as to what we fondly hope they may yet become, we should probably find that these particular parts of the city are a liability rather than an asset, even in the mere matter of revenue. We shall probably soon awake to the realization that land must be assessed and taxed on the basis of what use it may serve, rather than on the basis of what ultimate profit it may bring some individual.

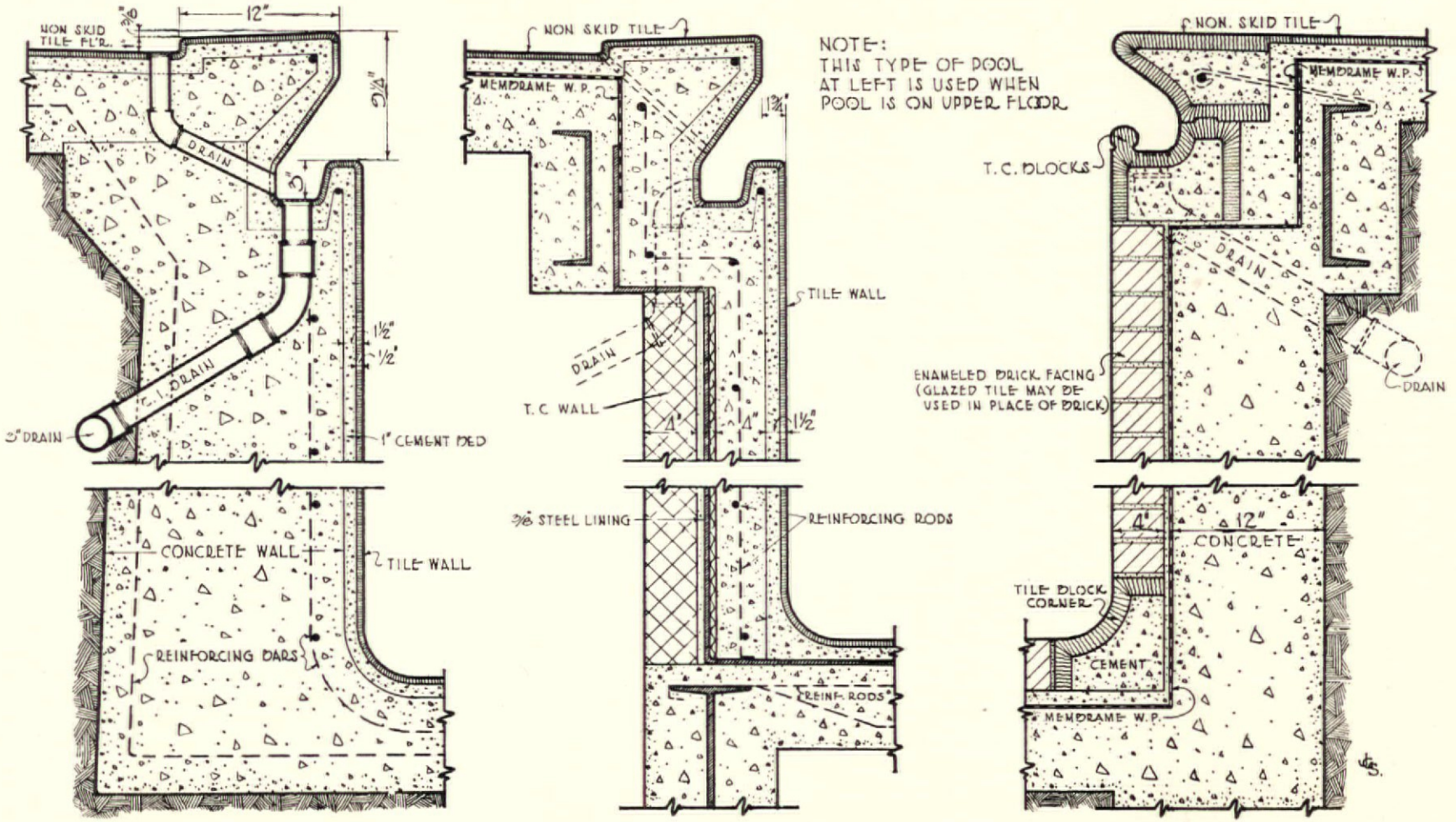
*Friday, December 2.*—Dr. Leicester B. Holland is on the warpath again, with his lance aimed at the practice of making museum trophies of our early American domestic interiors. The present uprising was brought about by the fact that a museum recently attempted to purchase a panelled room in Charleston, S. C. The aid of Albert Simons was sought, who informed the museum that he was opposed in principle to any antiquities being sold out of the city. As a matter of fact, I think Mr. Ernest Russell puts it rather well in urging museums "to abstain from the devastating practice of purchasing or installing interiors or other portions of early buildings except those whose demolition is inevitable."

*Monday, December 5.*—Clarence W. Farrier, who is assistant director of operation for the Chicago Fair, tells some particularly interesting phases of his experiences in *The Journal of the Western Society of Engineers* for October. The article is far too long to quote, but one point that impressed me was the scheme for preventing extreme heat losses from the Administration Building, which, of course, has been in use for some time. Space between the studs is blown full of a mixture of emulsified asphalt and old scrap paper, to which was added some sodium silicate to reduce the fire hazard. The total thickness of the wall is but little over four inches, yet it has the same heat resistance as a seventeen-inch brick wall, plastered.

Mr. Farrier reports considerable difficulty in painting this building. The exterior covering is a material made up of Portland cement and asbestos fibre, highly compressed to a thickness of one-quarter inch. Mr. Farrier blames neither the material nor the paint, but admits that the first paint job failed entirely and came off, and the second painting is fading badly. It would seem to be a matter for the paint research chemists.

*Tuesday, December 6.*—A. W. Robertson, Chairman of the Board, Westinghouse Electric and Manufacturing Company, delivered the Towne Lecture today before the annual meeting of the American Society of Mechanical Engineers in the Engineering Societies Building, New York City. It is a calm and worthy appraisal of society's present plight, with no attempted panacea. Rather, Mr. Robertson urges that human affairs should be studied with all the energy and devotion that we have been giving to science. The basic laws on which human affairs progress may be, must be, assured if man is to have any real control of his future.

*Thursday, December 8.*—D. Putnam Brinley today held a private view of his latest mural decorations, painted for The Metropolitan Life Insurance Company's new home office-building now near completion. I had the pleasure of examining these with Ely Jacques Kahn, chuckling over "The Adventures of Huckleberry Finn" in the cafeteria. The other series was "Scenes from Wild Life" in the elevator lobby of one of the basements. In Huckleberry Finn, Brinley has certainly achieved a naïveté and delightful humor in a particularly distinctive manner. There is an enormous area of these murals, an area which had to be painted in the course of a few months. Brinley's scheme provided for cartoons which were cut out, stencil-like, applied to the canvas, and the painting—or rather drawing—done with an airbrush.




# · DETAIL · OF · VARIOUS · SWIMMING · POOL · SECTIONS ·

A SERIES OF WORKING DRAWINGS BY JACK G. STEWART

· SCALE : 0 3" 6" 9" 1'-0"

· PLATE · Nº 33 ·

*Friday, December 9.*—The diverse wanderings of a certain marble column have apparently ceased, perhaps permanently. Stanford White discovered the column in one of his rambles through Italy, and brought it to America. During his lifetime it remained in a marble yard in New York City. After White's death the column was purchased by two daughters of Abram S. Hewitt, a former mayor of New York, who had it erected at the grave of their father in Greenwood Cemetery. Recently it was found to be weathering badly, so Erskine Hewitt presented it to Cooper Union, of which his father was a benefactor, and it has been placed in the entrance of Hewitt Building.

*Saturday, December 10.*—Horace Peaslee, of Washington, has taken up cudgels for cities of the dead. Mr. Peaslee happens to be consulting architect for the Fort Lincoln Cemetery at Washington, and the Wintergreen Gorge Cemetery at Erie, which experience led to his further observations of the fact that while cities of the living are planned by experts, built by architects, and adorned by artists, cities of the dead are left to the haphazard direction of commercial interests. His hope for improvement lies in the co-operation of architects and landscape architects with cemetery authorities. He feels that "every private cemetery should require that each monument be approved by a consulting architect." Why not by an art commission consisting of an architect, landscape architect, and sculptor?

*Monday, December 12.*—With Russell Whitehead, Claude Bragdon, Eugene Schoen, William Van Alen, and others to see the *Conte di Savoia* upon the completion of her first trip across the Atlantic. Mr. Gustavo Pulitzer, who designed all of the interior of the boat with the exception of the main salon, guided us over the liner. Two things impress one: the clarity of the plan—one knows where he is and where he is going at any point; and second, Mr. Pulitzer's amazing fertility of imagination in the use of materials. He brings everything upon his palette—rare woods, bamboo sticks, parchment, etched metals, incised plaster, pictorial inlays of woods, copper for a dance floor, reeded columns, rare minerals, and unusual textiles. Throughout, moreover, he has shown a particular flair for the use of unexpected colorings in successful combination.

*Tuesday, December 13.*—A letter from Samuel Yellin, who has been in France for the better part of a year building up his health, tells me that he is expecting to sail for America this month, which will be good news for his many friends.

*Thursday, December 15.*—Ellis Jackson of Providence thinks that in recent years we have rather overdone the matter of elaborating the commercial structures. The choicest marbles, most carefully fabricated bronzes, some of our best murals, and particularly rare woods from all over the world, have been used to embellish commercial buildings. Jackson's idea is that this has tended to cheapen the chief means by which our public buildings have heretofore been distinguished. In other words, if we see these rare materials and elaborate craftsmanship in our office-buildings, we are inclined to appreciate them less in our libraries, museums, and other public works—and if we have done our best in the lesser work, we have nothing further to offer.

*Friday, December 16.*—William Sydney Wagner, who died last summer at Northport, lives on in the memories of many friends. Some of these friends have just erected in Northport Rural Cemetery, on a hill overlooking Long Island Sound, a monument to this man who was an architect of great promise through his own persistence and tireless efforts. Sydney Wagner did not have the opportunities of a college education, yet in 1907 he won the Paris Prize, enabling him to study at the Ecole des Beaux Arts in Paris for two and a half years.

The monument which has just been erected was designed by Otto R. Eggers and Edward Field Sanford. The slab of Vermont marble came through Lou Crandall of the George A. Fuller Company. John Donnelly carved the figure that Sanford modelled, and the foundations and setting were provided by Clair Wills of C. T. Wills, Inc.

*Monday, December 19.*—It is interesting to note the disappearance, in the most recent work of electrically lighted signs for theatres, of the old scheme of forming letters out of the bulbs themselves. Roxy's new theatre in Rockefeller Center provides a recessed box in the front edge of the marquise, the box being rather plentifully filled with bulbs and painted a highly reflective white. Cut-outs are interposed in the front recess, changing the lettering in this way.

I notice a still more elaborate scheme in one of the new Trans-lux theatres. Here the slightly recessed background is lined with closely parallel neon tubes, alternating in red and blue. The cut-out letter is again used in front of this, and by alternating and combining the red and blue tubes a particularly arresting sign is flashed. An ingenious detail of the scheme provides cut-out letters that are themselves sloping, thereby gaining a "cross-hatched" color immediately behind them.

*Tuesday, December 20.*—An interesting ceremony took place in the Vanderbilt Gallery of the Fine Arts Building lately when the heirs of the late Alfred D. Lenz, American sculptor, presented to the American Artists' Professional League the details of the Lenz process of casting metals. F. Ballard Williams, president of the League, said that Mr. Lenz had been regarded as "one who seemed to possess some magic power over the crucible," particularly when he finally succeeded in combining several different metals or alloys in one cast. The National Sculpture Society will publish in book form the formulas, diagrams and explanations.

*Wednesday, December 21.*—In the old days when one wanted to talk science he went to a particular club for luncheon where science would most certainly be discussed, to another for architecture, to another for sports. In these days one has no choice. The conversation where any two or three are gathered together is of economics, with a number of widely differing opinions that matches precisely the number of persons present.

*Thursday, December 22.*—Between national inertia, largely on the part of investment sources, and through direct opposition of the National Association of Real Estate Boards, housing is making no progress. The latter organization bases one of its objections to the use of public credit for limited-dividend, tax-exempt, State-supervised, multi-family housing on the theory that if these projects are carried out, they will be of no benefit to the poorer classes for whom they are intended. This argument apparently avoids the rather evident fact that new housing never has sheltered the poorer classes themselves, but has, on the other hand, provided a step upward for these classes by moving the present occupants of old housing that is necessarily on a lower scale, both in accommodations and rentals. Until we arrive at a very much higher plane of civilization, it is obvious that this progression by steps will be the chief means of bettering housing conditions. As one family moves up into, say, newly built dwellings, a less fortunate family moves out of a hovel into the dwelling just vacated. One serious fault in this method of progress is that we are so loth to destroy the hovel after it has been vacated, trusting instead that some poor unfortunate family will have to utilize it.

# BOOK REVIEWS

SIX VOLUMES ON THE PRESIDENT'S CONFERENCE

HOME OWNERSHIP, INCOME AND TYPES OF DWELLINGS. Reports of the Committees on Home Ownership and Leasing, ERNEST T. TRIGG; Relationship of Income and the Home, NILES CARPENTER; Types of Dwellings, JOHN IHLDER. Foreword by ROBERT P. LAMONT. 230 pages, 6 by 9 inches. Illustrations from photographs and graphs. Washington: 1932: The President's Conference on Home Building and Home Ownership. $1.15.

NEGRO HOUSING. Report of the Committee on Negro Housing, NANNIE H. BURROUGHS; Prepared for the Committee by CHARLES S. JOHNSON. Foreword by ROBERT P. LAMONT. 282 pages, 6 by 9 inches. Illustrations from photographs and drawings. Washington: 1932: The President's Conference on Home Building and Home Ownership. $1.15.

FARM AND VILLAGE HOUSING. Report of the Committee on Farm and Village Housing, ALBERT RUSSELL MANN; Prepared for the Committee by BRUCE L. MELVIN. Foreword by RAY LYMAN WILBUR. 293 pages, 6 by 9 inches. Illustrations from photographs, maps, and drawings. Washington: 1932: The President's Conference on Home Building and Home Ownership. $1.15.

HOUSING AND THE COMMUNITY—HOME REPAIR AND REMODELING. Reports of the Committees on Housing and the Community, JOSEPH H. PRATT, M.D.; Reconditioning, Remodeling, and Modernizing, FREDERICK M. FEIKER. Foreword by RAY LYMAN WILBUR. 291 pages, 6 by 9 inches. Illustrations from photographs and drawings. Washington: 1932: The President's Conference on Home Building and Home Ownership. $1.15.

HOMEMAKING, HOME FURNISHING AND INFORMATION SERVICES. Reports of the Committees on Homemaking—Housing and Family Life, MARTHA VAN RENSSELAER; Home Furnishing and Decoration, RUTH LYLES SPARKES; Home Information Services and Centers, PEARL CHASE. Foreword by RAY LYMAN WILBUR. 238 pages, 6 by 9 inches. Illustrations from photographs and drawings. Washington: 1932: The President's Conference on Home Building and Home Ownership. $1.15.

HOUSING OBJECTIVES AND PROGRAMS. General Sessions of the Conference. Reports of the Correlating Committees on Technological Developments, GEORGE K. BURGESS; Legislation and Administration, BERNARD J. NEWMAN; Standards and Objectives, LAWRENCE VEILLER; Education and Service, ALBERT SHAW; Organization Programs, Local and National, HARLEAN JAMES; Research, JAMES FORD. Foreword by ROBERT P. LAMONT. 345 pages, 6 by 9 inches. Illustrations from photographs. Washington: 1932: The President's Conference on Home Building and Home Ownership. $1.15.

The above are the six volumes which, together with five previously issued, constitute the official record of The President's Conference on Home Building and Home Ownership. Under each of the titles above, the names of individuals are those of the committee chairmen; it is impossible, of course, to ascribe more definite authorship to these volumes, in the preparation of which the work has been so widely divided. The publications as a group have been edited by John M. Gries and James Ford. Years of study on the part of outstanding authorities have been put, directly or indirectly, into this great work. It might fairly be called an encyclopædia of American home making.

---

MATERIALS AND METHODS OF ARCHITECTURAL CONSTRUCTION. By CHARLES MERRICK GAY and HARRY PARKER. 639 pages, 6 by 9 inches. Illustrations from drawings and photographs. New York: 1932: John Wiley & Sons, Inc. $6.

The authors, both of whom are professors of architectural instruction in the University of Pennsylvania, have condensed in one volume the essential textbook information concerning materials and their use in building construction. While the book is not intended to be a handbook, the material is so concisely and logically presented as to bring it practically into the field of the architect's office tools.

PHYSICAL PROPERTIES AND WEATHERING CHARACTERISTICS OF SLATE. By D. W. KESSLER and W. H. SLIGHT. 35 pages, 6 by 9 inches. Illustrations from photographs. Research Paper No. 477. Pamphlet binding. Washington: 1932: U. S. Department of Commerce, Bureau of Standards. 10 cents.

COLONIAL ARCHITECTURE OF CAPE COD, NANTUCKET AND MARTHA'S VINEYARD. By ALFRED EASTON POOR. 120 pages, 8 by 10½ inches. Illustrations from photographs and measured drawings. New York: 1932: William Helburn, Inc. $8.40.

With the acceptance of the "Cape Cod Type" over such a wide area of the country, it is rather surprising that the task of illustrating the originals in photographs and measured drawings has not long since been undertaken. Mr. Poor's unquestioned service to architectural literature is therefore all the more welcome.

THE SEVENTY-SIXTH IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

# ARCHITECTURE'S PORTFOLIO OF INTERIOR DOORS

*Subjects of previous portfolios are listed below at left and right of page*



1926
- DORMER WINDOWS
- SHUTTERS AND BLINDS

1927
- ENGLISH PANELLING
- GEORGIAN STAIRWAYS
- STONE MASONRY TEXTURES
- ENGLISH CHIMNEYS
- FANLIGHTS AND OVERDOORS
- TEXTURES OF BRICKWORK
- IRON RAILINGS
- DOOR HARDWARE
- PALLADIAN MOTIVES
- GABLE ENDS
- COLONIAL TOP-RAILINGS
- CIRCULAR AND OVAL WINDOWS

1928
- BUILT-IN BOOKCASES
- CHIMNEY TOPS
- DOOR HOODS
- BAY WINDOWS
- CUPOLAS
- GARDEN GATES
- STAIR ENDS
- BALCONIES
- GARDEN WALLS
- ARCADES
- PLASTER CEILINGS
- CORNICES OF WOOD

1929
- DOORWAY LIGHTING
- ENGLISH FIREPLACES
- GATE-POST TOPS
- GARDEN STEPS
- RAIN LEADER HEADS
- GARDEN POOLS
- QUOINS
- INTERIOR PAVING
- BELT COURSES
- KEYSTONES
- AIDS TO FENESTRATION
- BALUSTRADES

*Below are the subjects of forthcoming Portfolios*

Metal Stair Railings
MARCH

Verandas
APRIL

The Eagle in Sculpture
MAY

Eaves Returns on Masonry Gables
JUNE

Exterior Lettering
JULY

Entrance Driveways
AUGUST

*Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up about six weeks in advance of publication date.*

1930
- SPANDRELS
- CHANCEL FURNITURE
- BUSINESS BUILDING ENTRANCES
- GARDEN SHELTERS
- ELEVATOR DOORS
- ENTRANCE PORCHES
- PATIOS
- TREILLAGE
- FLAGPOLE HOLDERS
- CASEMENT WINDOWS
- FENCES OF WOOD
- GOTHIC DOORWAYS

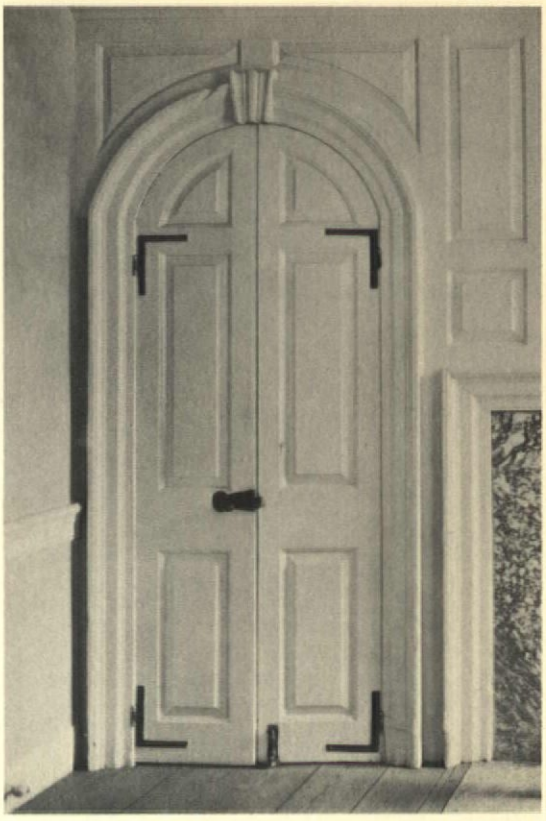
1931
- BANKING-ROOM CHECK DESKS
- SECOND-STORY PORCHES
- TOWER CLOCKS
- ALTARS
- GARAGE DOORS
- MAIL-CHUTE BOXES
- WEATHER-VANES
- BANK ENTRANCES
- URNS
- WINDOW GRILLES
- CHINA CUPBOARDS
- PARAPETS

1932
- RADIATOR ENCLOSURES
- INTERIOR CLOCKS
- OUTSIDE STAIRWAYS
- LEADED GLASS MEDALLIONS
- EXTERIOR DOORS OF WOOD
- METAL FENCES
- HANGING SIGNS
- WOOD CEILINGS
- MARQUISES
- WALL SHEATHING
- FRENCH STONEWORK
- OVER-MANTEL TREATMENTS

1933
- BANK SCREENS



*Greville Rickard*



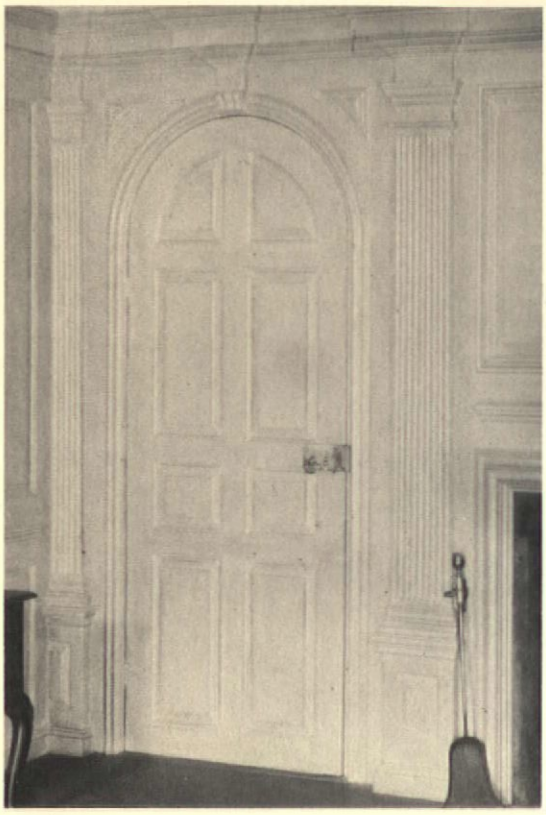
*Valley Forge Headquarters (1760)*

*Remington House (1806), Cazenovia, N. Y.*



*Benjamin W. Morris*







*Orne House (c. 1730), Marblehead, Mass.* *Hentz, Adler & Shutze*

*Aymar Embury II* *Mott B. Schmidt*





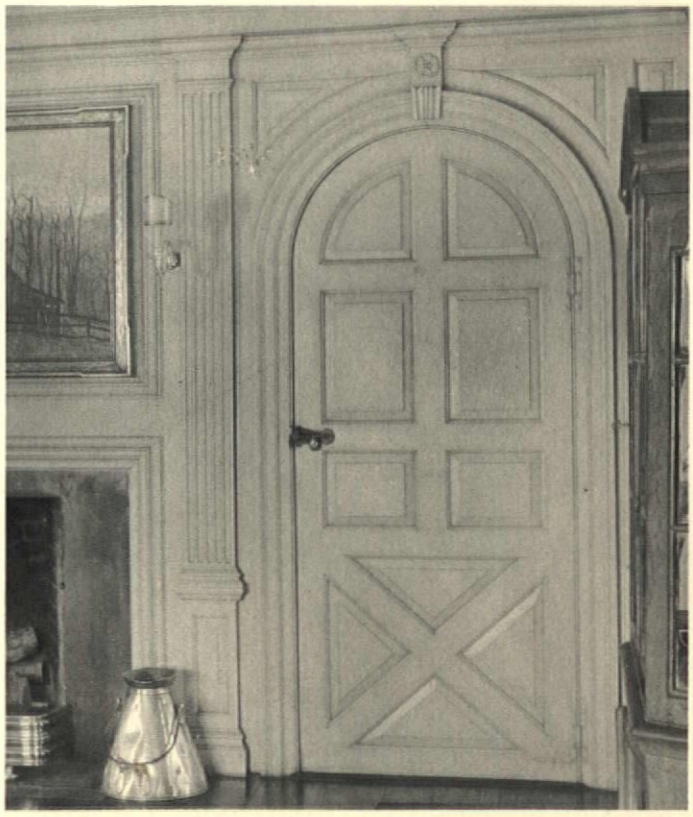


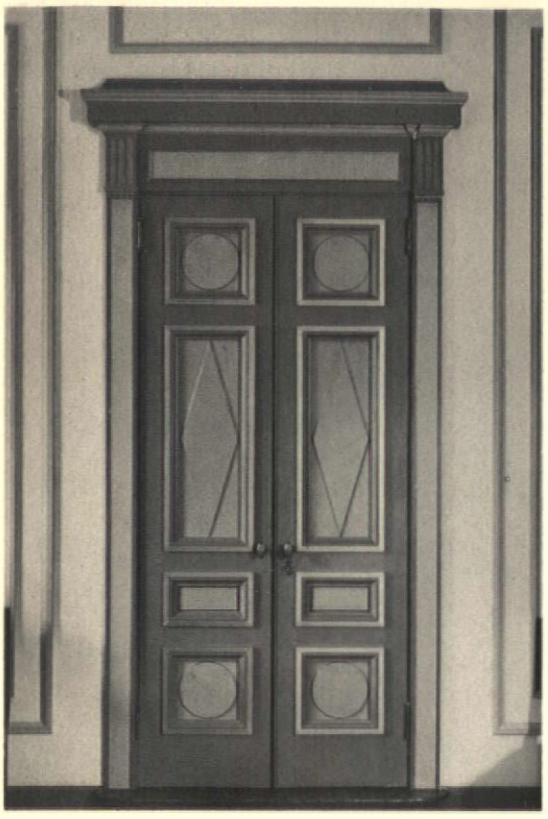



*Fiskdale (c. 1750), Worcester County, Mass.* *H. M. Woolsey*

*Electus D. Litchfield* *Roger H. Bullard*







*Rodgers & Poor*



*Aymar Embury II*

*Cameron Clark*



*LeRoy P. Burnham*





*Gordon B. Kaufmann*

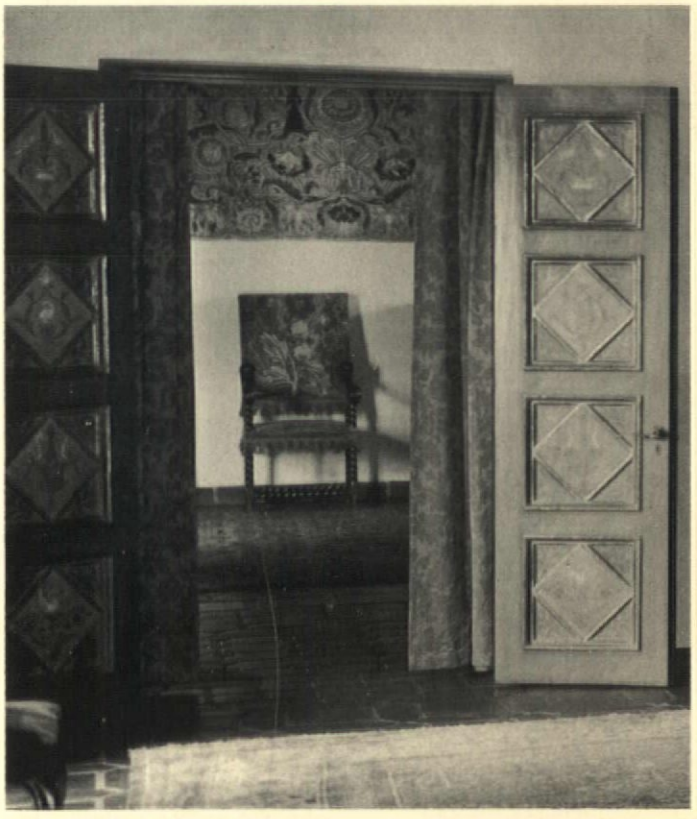


*Schultze & Weaver*

*Miller & Martin*



*Gordon B. Kaufmann*





*H. H. Whiteley*



*Delano & Aldrich*

*Gordon B. Kaufmann*



*Evans, Moore & Woodbridge*



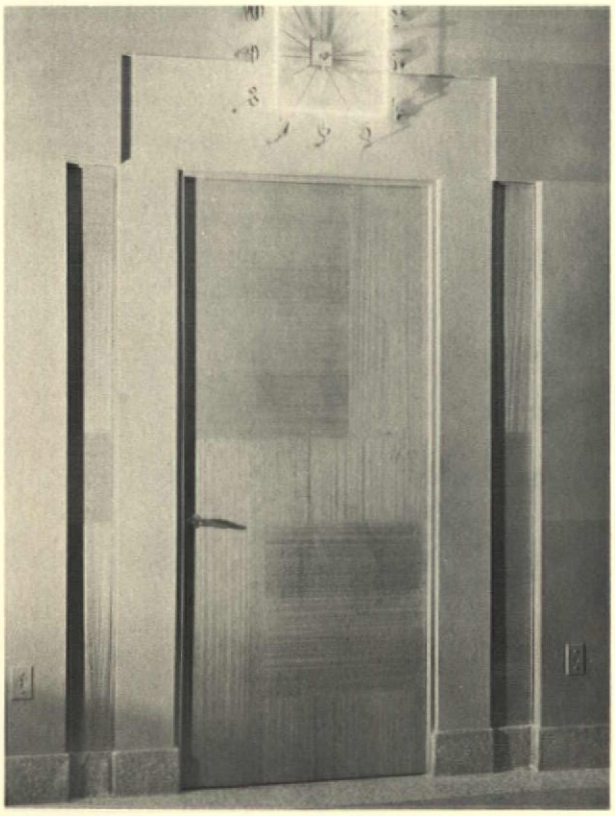


*Holabird & Root*



*Walter W. Ahlschlager, Inc*

*John Parkinson and Donald B. Parkinson*

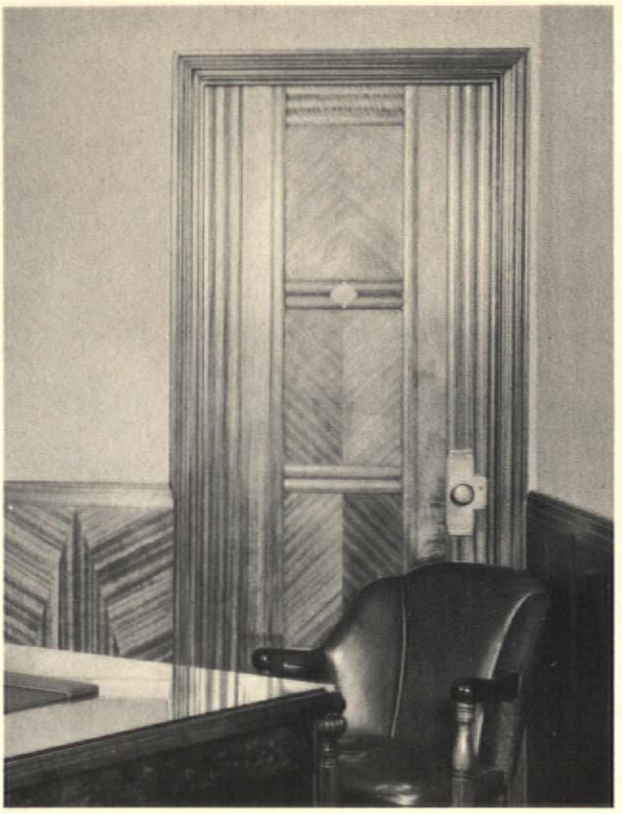


*Waldron Faulkner*





*Robert Von Ezdorf*



*Morgan, Walls & Clements*

*McClelland, Pennch & Jones*



*Samuel Lunden; John Parkinson and Donald B. Parkinson*



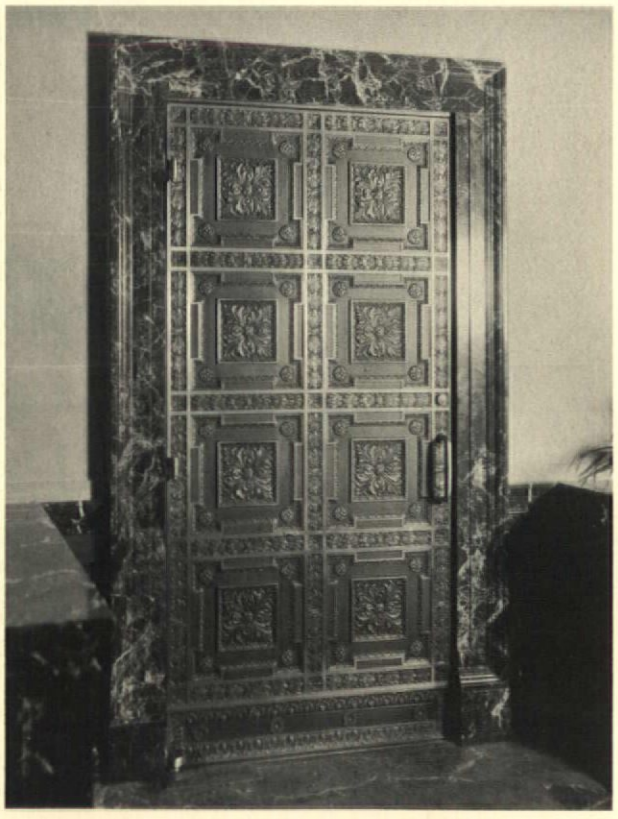


*John Mead Howells and Raymond M. Hood*



*The Firm of Ely Jacques Kahn; Sherley W. Morgan*

*Walker & Eisen*



*Frank J. Forster*





*Cross & Cross*



*John Parkinson and Donald B. Parkinson*

*Wesley S. Bessell*



*Mrs. Jack Gardiner's bedroom*



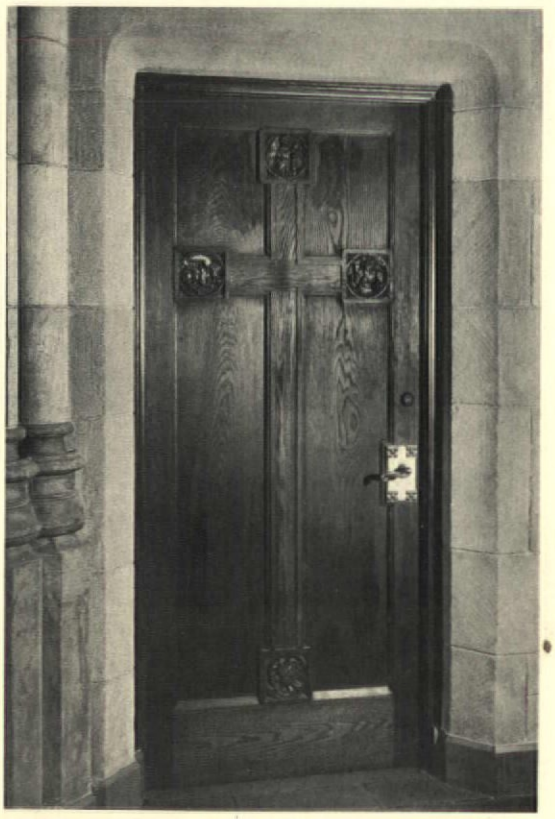


*Dwight James Baum*



*Frederick J. Sterner*

*H. C. Pelton; Allen & Collens*



*Dwight James Baum*





*Allen G. Siple*



*York & Sawyer*

*Gordon B. Kaufmann*

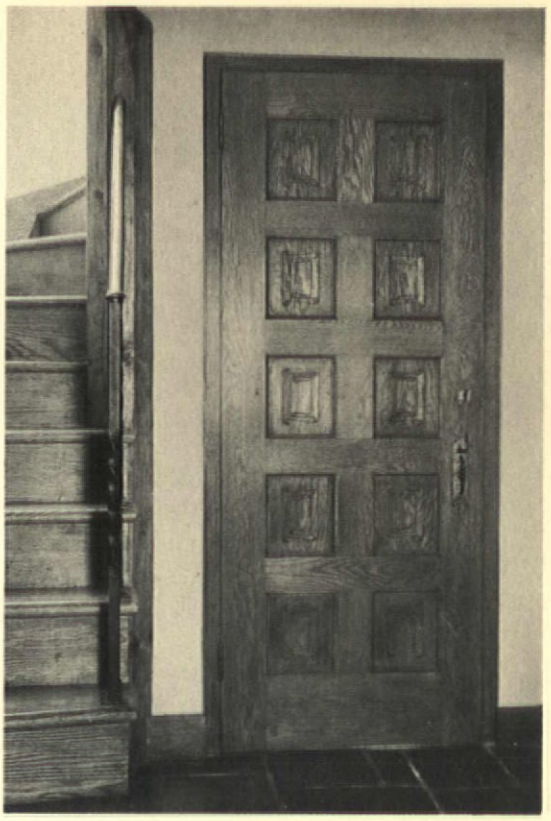


*Edward S. Hewitt*





*Frank J. Forster*



*Frank J. Forster, R. A. Gallimore*

*Granville Dexter*



*From Zurich, Switzerland (c. 1630), now in Toledo (O.) Museum*





*Wesley S. Bessell*



*Lockwood House, Taos, N. M.*

*Cram & Ferguson*



*Ludlow & Peabody*





*Harry Allen Jacobs*

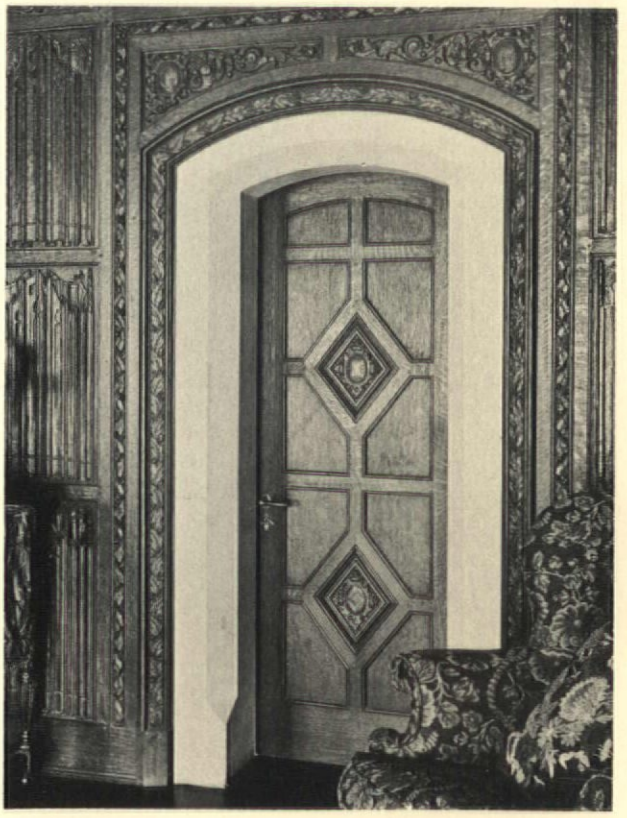


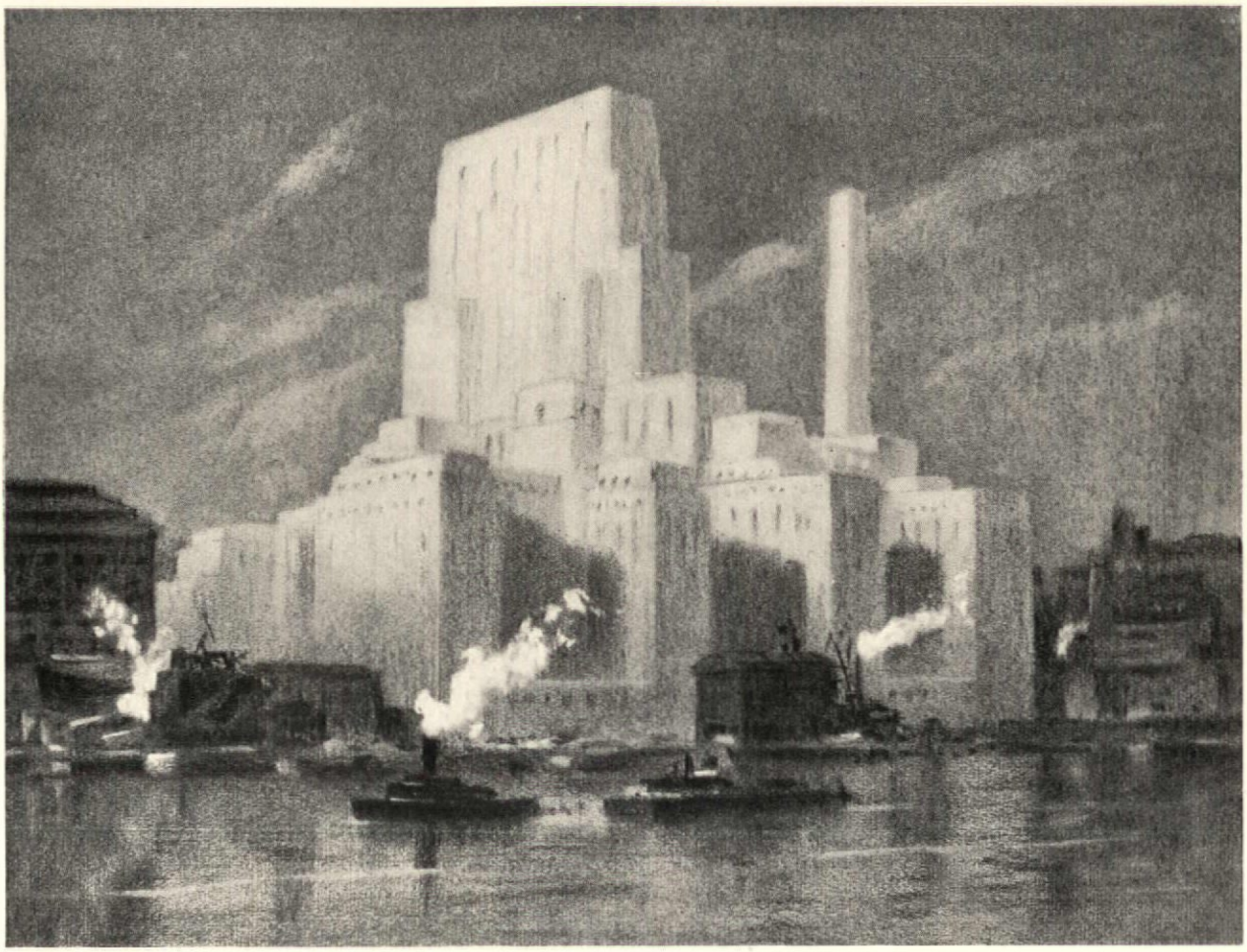
*Benjamin Berry*

*Charles M. Hutchison*



*Albert Kahn, Inc.*





NEW YORK HOSPITAL-CORNELL
MEDICAL COLLEGE ASSOCIATION GROUP
FROM THE EAST RIVER
*From the drawing in charcoal by E. P. Chrystie*

ARCHITECTURE

VOLUME LXVII MARCH 1933 NUMBER 3

# The Sad Story of American Housing

*By Henry Wright*

CONSULTANT IN TOWN PLANNING AND HOUSING

PHILADELPHIA, "city of brotherly love," has many fine traditions. The gridiron street system, laid down by William Penn, is not to be counted among them. As a city-planning method it constituted a mistaken experiment that has since ripened into a calamitous habit. The gridiron city plan brings about the narrow attenuated lot quite as directly as the shape of a pork chop is dependent on the ribs of the hog. In Philadelphia itself, these lots were occupied full width by closed rows of the "town house"; but not even the virtues of these closed rows, such as they were, remained when the gridiron crossed the Alleghanies and migrated over the national highway, or "overland," route into the Central West.

The most extensive and natural habitat of the gridiron street, with its attendant narrow lot and sunless side alley, has not been geographic but psychological, in the real-estate operator's mind. Here these three have been lodged as tenants by perpetual lease, salamanders never to be burnt out by even the hottest fire, or perhaps even as ineradicable grooves worn into the brain. To suggest that better methods were available has made no impression. To erect physical examples, in which the superiority of other methods has been successfully demonstrated, has as yet caused hardly a ripple. There remains, then, for us to examine the product of this speculative builder himself, to see whether the recent depression-sobered past has led him to develop anything *within* his narrow frame upon which we might predicate some kind of an advance, however halting, toward an adequate housing procedure.

The gridiron street pattern spread rapidly over almost the whole country during the period of rapid expansion and city building of the nineteenth century. The expansion followed the great avenues of commerce. Thus we find a brick town architecture, closely modelled on the seaboard cities in form and appearance, extending to Pittsburgh, and thence down the Ohio River to Cincinnati, to Louisville, and eventually to St. Louis on the upper Mississippi River. Other traditions than those brought over the mountains may have contributed in these new cities to the arrangement of the houses in detail. But in shape and general appearance the early houses of all these cities distinctly recall Philadelphia. The row principle in itself is not undesirable; in fact, row houses properly planned constitute the most hopeful form of low-cost single-family dwelling to be found here or in Europe. It is the tradition of the *narrow lot* with which we are concerned.

In the Pittsburgh area the practice of continuous row grouping was continued, and again at Wheeling. Even in the small town of Mount Pleasant, Ohio, near Wheeling, where land could scarcely at any time have been worth more than a few cents a square foot, houses on the main street were built in attached rows. In one case (here illustrated) an archway was placed at the end of the group to reach the rear yard, the house wall being carried up windowless on the property line.

But an important change took place when city building reached the more open plain of the Ohio Valley at Cincinnati. Here the town house met the impact of the pioneer spirit. The house

This article is adapted from a chapter of Mr. Wright's forthcoming book, *How Shall We House?* the manuscript of which is now being made ready for the press.—EDITOR.



*The Philadelphia row house of 1850—which with the gridiron plan and narrow lot have caused most of our housing troubles*



*In Mount Pleasant, Ohio, 1870, where the row house was continued with an archway at the end of the group to reach the rear yard*



*St. Louis, 1880, where our rugged individualism separated the houses by two feet—wide enough for the alley cat, but not for windows*

was split from its neighbor by a narrow side yard—sometimes a mere passageway, sometimes faced by a few small windows. At St. Louis the precedent of Philadelphia is quite evident. But here the cleft between the houses divides them by only two feet—it is too narrow for passage except by alley cats, and is utilized for no window exposure; it is entirely meaningless, therefore, except as a vigorous expression of what our "rugged individualism" occasionally leads us to. Half a century has passed since this particular expression flourished; it has been discontinued on any large scale; but the fetish that inspired it has remained dominant throughout all the subsequent housing evolution.

Let us trace this evolution through a period of thirty years in the typical building construction of St. Louis. We shall find constant change, virtually devoid of any significant progress. From the town house characteristic of the 1870–1890 period we pass to the less stilted city house of 1890–1900. This latter is less rectangular, but it keeps to the narrow side yard. There is not yet a pressure from the rise of frontage costs that would explain such crowding.

At the turn of the century the increased complexities of street utilities have pushed up frontage costs to a point requiring more intensive use. The two-story house is evolved, with one family on each floor. This type is known generally as the "St. Louis flat," although it is by no means confined to St. Louis, since Chicago, for example, houses 375,000 families in this type of dwelling. The rectangular plan has to be lengthened, and the additional length emphasizes still more clearly the fissure-like character of the side yard.

For a decade the detached two-decker satisfied the demands of frontage economy. Then the unguided processes of rugged individualism, exemplified in neighborhoods of repetitive brick fronts, required a further contraction. The two-family unit was doubled along the party wall. This called for long dark interior halls and an exposure for most of the rooms on the narrow side yard. The arrangement of the rooms themselves in tandem, one behind the other, is an onerous one for purposes of housekeeping; yet it is the actual or at least the progenitive pattern of at least 70 per cent of the present housing in St. Louis, and of an even greater proportion in Chicago, to say nothing of Cleveland, Cincinnati, and Newark. The original Eastern row house was in itself fairly reasonable; it is the precedent which it established, of narrow-lot squeezing, which has done all the damage, having been accepted ever since as a necessary accompaniment of moderate-cost dwellings.

The fourth step in the evolution in these cities (the group now expanded by the inclusion



*St. Louis, 1890–1900—the house less stilted, but holding the narrow side yard even at the low cost of lot frontage*



*St. Louis, 1900–1910—the evolution of the "St. Louis flat," with plan lengthened and narrow side yard handicaps intensified*



*St. Louis, 1910–1920—doubling the two-family unit on a party wall and providing long interior dark halls, still with narrow yards*

of Kansas City and similar later communities) was to build up the double two-family flat to three stories. The tandem room arrangement was of course retained. The side yard remained narrow as before, and not only was its shadow deepened still further by the new floor, but, in the popular mode of the day, porches were added front and back as a still further discouragement to the feeble, smoky sunlight of these industrial cities. Nor was the situation relieved when the demands for larger dwelling space required the widening of the double unit, to gain a narrow extra room at the front and the rear. This process increased the distance in all the intermediate rooms from the inner wall to the window, which transmitted none too much light as it was.

The final decade has seen the expansion of the widened three-story double flat for service in the high-rent field. An interior court is introduced to form a U, with many of the rooms still ranged along the persistent narrow side-line courtyard. Chicago offers variations on these new atrocities, first by the introduction of the three-story detached flat (embracing about 170,000 dwellings), and then by closing up the front façade to give the effect of a nice continuous row, a procedure which just happens to cut off the already scanty circulation of air along the side courts.

Meanwhile, in many smaller cities the effort was successfully carried through to widen the standard lot. Forthwith an unguided public demand for the still more wasteful "bungalow" of one story filled up and overcrowded the lot in its new generous proportions. By 1930 even the builder himself realized that these bungalows looked somewhat awkward, jammed together. A movement then spread to camouflage the bungalow as a modest cottage. A high-pitch "cross gable" was turned across the front façade, to hide the huge mass of the house as it lumbered rearward, its main roof being kept invisible by virtue of a lower pitch. This ingenuity was cleverly manipulated in many Minneapolis examples, but botched in other cities. The ubiquitous front chimney, badly placed for living with, but easy to advertise, was also characteristic of this period.

Here at last was a spark of hope. Having once turned the roof, the builder might by some accident have hit on the corresponding expedient of rearranging the whole house. Having created the effect, he might have followed with the plain fact. At least he might have modified those extreme mistakes of form which had led him into the ultimate confession implied by his camouflage. But no, the spark of hope flickers and dies out. In 1929, 1930, 1931, we find the practical builder repeating the evolution that



*St. Louis, 1915–1925, extended the double two-family dwelling upward to three stories, retaining the tandem lay-out and adding porches*



*St. Louis, 1925–1930—the expansion of the widened tree-story double flat to the high-rent field, in which an interior court is introduced to form a "U" plan, still with the narrow side yards. Chicago followed suit with about 170,000 dwellings*

had already taken place in 1903, 1904, 1905. The causes and the effects are naïvely simple.

The bungalow is popular, therefore the accommodating realty effort, "striving to please," must retain it. Keeping an ear to the ground, "understanding and interpreting the public demand," is the admitted major accomplishment of the real-estate profession. But the bungalow, particularly in its crude narrow-lot form, happens to entail waste and expense which sooner or later register themselves as "sales resistance," something which, we regret, has never been countermanded by any Eighteenth Amendment. So the resourceful mind of the speculative builder invents the "investment bungalow," with an annex on the rear attic for a subtenant who pays part of the rent. Some sacrifice is appropriately required of the owning family on the first floor. The extra stairway needed for the new upper tenant crowds the living-room of the main unit forward into the erstwhile sun porch.

The next step for the practical mind is naturally to provide more space above for more rent, and the upper dwelling is consequently expanded into almost a full replica of that below. Almost, because the new two-family structure must still masquerade as a modest bungalow—for who wishes to admit his dependence on his neighbor (above) for the lion's share of his monthly costs? Very ingeniously the public is coddled into receiving this almost final step in the undoing of its bungalow ideal—very ingeniously deceptive in front, but brutally frank behind.

Finally the top story pushes itself out into a full replica of the story below—but still not quite. The effect must still be guarded by the "draping" of a false gambrel roof, which doesn't really fool any one, but makes a highly valued variation for each alternate unit in an endless row of equally dreary façades. But, prize of all! throughout this whole process the hardy resistance of the speculative builder's mind has preserved its integrity. Look down the line of these full-fledged two-flat dwellings of 1931. The "sun porch" appendage is still maintained in its distinguishing brick appliqué as the front half of the living-room, tied into the frame half of this room by the fake brick fireplace, at each side of which is the proverbial small window over the proverbial bookshelves; the get-up distinctly advertising the interior dishonesty by the fact that one window is in frame and the other in brick.

Need we introduce further evidence of the innate poverty of the whole ridiculous procedure? True enough, the public at first glance thinks it is getting the most house for its money if every available inch of the lot has something on it; but not even the general public insists on buying the largest suit of clothes in a store, or even insists any longer on the bulkiest furnace. When we consider such items as the construc-



*The Minneapolis bungalow of 1930. The lot was widened, but the unguided popular demand for the one-story dwelling filled up this additional width. Here the row house is camouflaged to simulate a row of detached cottages. The badly placed but well advertised front chimney is characteristic of the period*

tion wastes and the heat losses of our present-day, long, leaky barges, the calculation is less one of standards of sunlight or comfort than one of plain arithmetic; every ton of coal thrown out of the window decreases purchasing power, a part of which would have been available to the building industry. The public is ready to understand the comparative economics of the case whenever they are explained; but not so the builder. Housing progress in this country is impossible because of the inadequacy, amateurishness, and incapacity of those groups to whom it has been entrusted as a side line to land merchandising and the mortgage business. It is time here as elsewhere for a distinctly "new deal."

We are not concerned, in this discussion, with land economics or finance as such. We are interested in them only in relation to housing. Hitherto they have pretty well buried housing.

If we stick strictly to the problem before us, determining that in some fashion or other housing must be accomplished, then from our standpoint it is a nuisance that so much of the "economics" of the land is entirely distinct from its useful employment.

Progressive housing, as practised both in this country and abroad, is based on the principle of compact districts developed to their fullest use in advance of any improvement of adjacent areas—such practice permits reasonable land development and specific planning. The general American practice, on the contrary, is one which permits vast areas around the city to be bought up years in advance of any possible use and held for ostensible "ripening." Figures covering the city of Grand Rapids, and assembled by Professor Ernest M. Fisher, of the University of Michigan, show a not unusual case. During twenty-two years, 1909–1931, covered by the study, approximately two lots were platted for every one used for building purposes. The whole number of lots used was only slightly greater than the number available and unused in 1909. "If utilization of lots should continue at the average rate prevailing between 1909 and 1931, it would require thirty-five years to absorb into use all of the lots which are now vacant."

This statement of fact is sufficient, without further deductions, to exhibit the wildness and the irresponsibility involved. This practice of speculative holding carries a triple menace. In the first place, it prevents the assembling, at a low price, of land needed by actual developers. In the second place, it has led our cities to the installation of expensive public services, far in advance of possible use; and, what is more important, in the third place, the city plans are deprived of any real or definite objective in terms of a specific region to be used in a special way. The street pattern has therefore had to be reduced to the lowest standardized plane—a pattern of short blocks with an excessive number of cross streets requiring utilities and services. Thus we come upon the gridiron once more. No possibility has existed of foretelling which of the streets would be commercial and which entirely residential; and therefore *all* streets have been given the heavier construction necessary for commercial traffic.



*At right, the 1929 Buffalo bungalow. Next door to it is the next step of 1930–31 —the "investment bungalow," with an annex on the rear attic for a sub-tenant. The living room of the lower unit is crowded forward into what had started as a sun porch*

The development of the land as a separate operation from building has entailed excessive charges for the separate items of subdividers' overhead, carrying charges until use, and profit. The number of fees and other contributions required to bring the separate organizations along the different divisions and stages of the work into some kind of alignment has already been described in the book "Housing America" by the editors of *Fortune*.

Through these costs, plus the high taxes involved in the cities' wasteful procedure, all existing moderate-intensity housing areas have been subjected to an immense burden which has forced their conversion to more intensive uses. The more intensive use, capitalized in turn as higher land value, has imposed multi-story buildings which put further heavy demands on streets and public services, so that the vicious circle is completed, with congestion everywhere and mounting public costs. The ironic result to the citizen who works in the central business district is that city expansion, despite its high cost, has been carried beyond the point of any convenience to him in terms of location.

As to the habits of land subdivision, we shall encounter again and again the vicious effect of habits formed, all of which rest on the single-family house. Since the first development of an outlying area is generally in terms of this single, free-standing house, land is platted in narrow, deep lots, and this constriction of the lot remains as a disadvantage to every further step. The history of the flat is essentially the history of a potentially superior building type thwarted at the outset by the single-family lot.

## The Costs and Complexities of Housing Finance

It has been shown in frequently published studies that of the average dollar expended for home purchase in the United States, approximately twenty-seven cents go into financing and promotion charges. This is more than is spent either for construction materials or for labor on the job, and considerably more than the average actual cost of the land and its improvement. This exorbitant cost of financing arises chiefly from our system of junior mortgages, with their large element of risk accompanied by higher rates of interest, plus discounts, commissions, and renewal fees. That the risks are real is attested by the widespread bankruptcy of second-mortgage houses, and by the difficulties of finding reputable sources of junior finance.

The first step in the cure of this situation lies in the improvement of the housing product as such. Improved planning in terms of stable communities will decrease the risks of vacancies and obsolescence to a point permitting conservative sources of money safely to enlarge the scope of first mortgages. Second mortgages, if any, may then be stripped of most of their risk, and the amortization of all loans may be safely spread over materially longer periods than in present practice.

A desirable simplification would be for a larger proportion or all the mortgage money to come from a single source, a practice which can be justified for housing of demonstrated stability in use. Not even the most drastic economies achieved by skimping on construction costs could produce savings in rentals or in ownership charges equal to those to be derived from the slower rate of amortization resulting from stable financing.



*Here is the rear of the 1931 investment bungalow. It masquerades in front as a "Dutch bungalow," but drops all pretense in the rear. This is not a sporadic case, but represents the bulk of a year's building in a large city, approved for financing by reputable mortgage sources*

The final goal in housing finance, however, is not merely that of improving mortgage rates, extending amortization periods, or simplifying the present complicated mess of senior, junior, and sub-junior mortgages, desirable though this might be. Large-scale housing should and must find its place as a primary investment which will attract permanent money, not temporary mortgage advances which must rapidly be withdrawn less because the undertaking is risky than because the lender has limited means. Such investment money should stand at least on a par with other public utility securities as a permanent stock subscription—negotiable as collateral, to be sure, but remaining in the general housing enterprise, as opposed to any particular housing project.* The investment of such capital by the operating company in any particular housing unit would necessarily be protected by an adequate depreciation reserve, set aside regularly and specifically to offset probable reductions in current earning power from whatever cause. That is, it would take care of possible changes in surrounding conditions, making it possible to reduce rents, to allow for obsolescence or else to reduce it by undertaking alterations and renovations, and to permit complete restoration when necessary either in the same location or in another one. This would keep the capital continuously employed, without demanding the double drain on rentals for both depreciation and amortization which now is necessary in some degree even in large-scale projects, however well planned and managed.

* A very able series of articles published during 1932 in *Building Investment*, by Mr. Arthur C. Holden, vividly contrasts the nature of present-day real-estate investments and industrial ones.

As long as we remain dependent on mortgages, we are particularly handicapped by another bad financial habit, which consists in appraising projects on a wholesale basis. If gross cubage is to be the only measure, then a wasteful building not only escapes punishment but is often rewarded for its waste. Better planned, better built, and, most especially, better managed and protected projects should definitely be entitled to preferential treatment, both in priority of mortgages and in per cent covered by mortgage, although such preferment is seldom encountered today.

S

Quite another aspect of this subject has to do with the general extravagance and multiplicity of business charges assessed against house construction at every stage of production, from the subdivision of the raw land up to the trussing of the purchaser in his own shoe-string. It might be considered going rather far to suggest that this sort of thing is respectable rather than racketeering, were it not that so many respectable agencies are implicated at some point in the process of building, mortgaging, advertising and selling. If there is any one best reason why investments in the field of "home" building have dried up, it lies in the practices connected with nearly every phase of production. The growing insistence that the first mortgage cover a lower per cent, and the demand for bonuses, arise directly out of the fact that those who supply mortgage money know too much about the



*Buffalo, 1931, the second year of the depression. The top story is extended forward to make a full replica of the flat below, but the fact must still be hidden by the draping of a false gambrel-roof effect. The sun-porch appendage is still distinguished by its brick appliqué as the front half of the living-room, tied into the frame half of this room by a fake brick fireplace, on each side of which is the small window over the proverbial book shelves*

inside workings of the system, and properly hesitate to loan more than the equivalent of the actual tangible assets. At the time when Sunnyside was built, there was a certain house in it that was offered at $8,300; one of the largest and most respectable agencies building in a competitive district offered an apparently equal house at $6,000. Equalizing the land value of the two houses by subtracting the extra cost in Sunnyside of improved vacant land, the Sunnyside house would come to $7,650. Yet the actual expenditures going into the complete building (all payments for labor, materials, equipment, fixtures, decoration and the like, and also building overhead) were only $2,450 for the competing house as against $5,212 for Sunnyside. Or, stated somewhat differently, the purchase price in the two cases represented *construction* costs as against *marketing* costs in very different proportions. For the $6,000 house, lot and improvements cost $675; landscaping $175; building complete $2,450; and then came a marketing overhead of $2,690, or about 45 per cent of the price. For the $8,300 cost, the same items were $1,325, $200, $5,212 and $1,563 respectively—that is, 61 per cent went into building and only 19 per cent into marketing overhead.

## WHAT HOPE FROM PRESENT METHODS?

Have we now reached the point at which we can summarize what seems to be the present situation? We find that our cities not only suffer from slums but are riddled with blight throughout the great range of their supposedly middle-class construction. Such blight calls for rehabilitation before we can safely engage in any further irresponsible expansion. When we examine the housing types available for such rehabilitation, we find that we have an increasing proportion of group dwellings housing more than a single family; the single-family house is doomed to a permanent recession. These multi-family houses of ours—mostly flats, and only 5 per cent of them serviced apartments—have grown up under the hand of the speculative builder. We find them still struggling, as in 1900, with the narrow, single-family lot, or derivatives that are only slightly modified. We find the enterprise hampered by excessive holding of land for "ripening," by huge city outlays for services that cannot serve, by financial charges which represent in the main a measuring-rod of the chaos. We may now look about to see whether these normal processes of real-estate and speculative building are likely to improve. The answer, unfortunately but very positively, is "No."

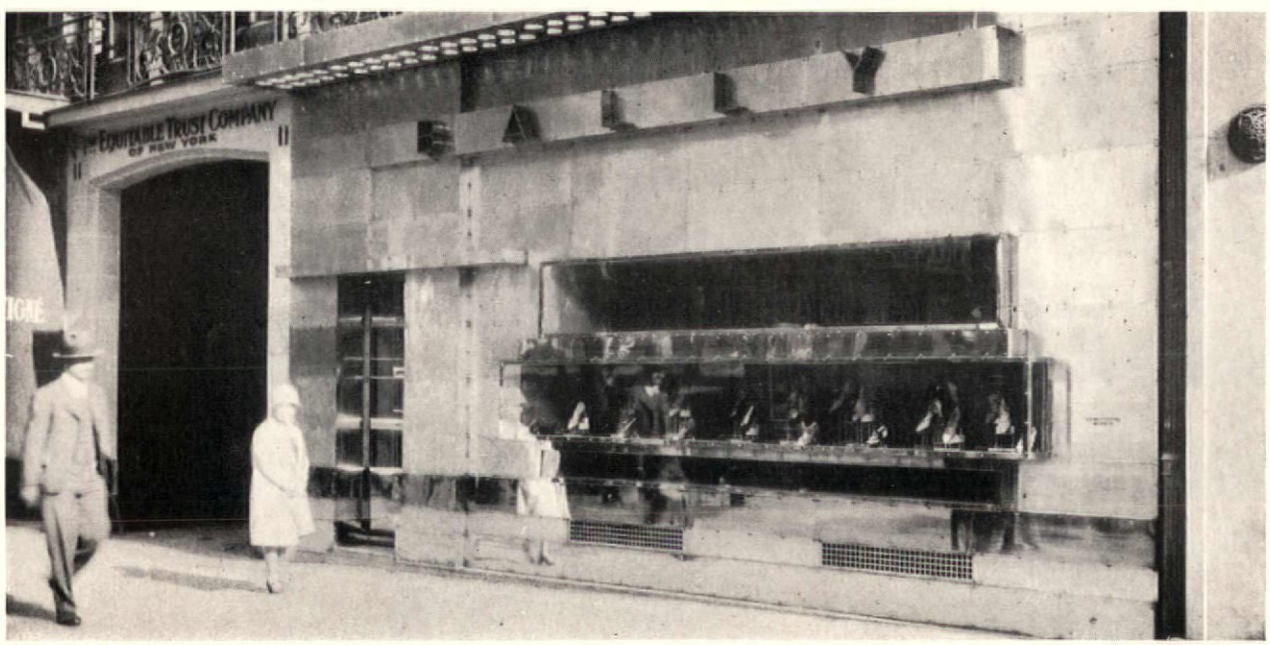
# Parisian and Dutch Shop Fronts

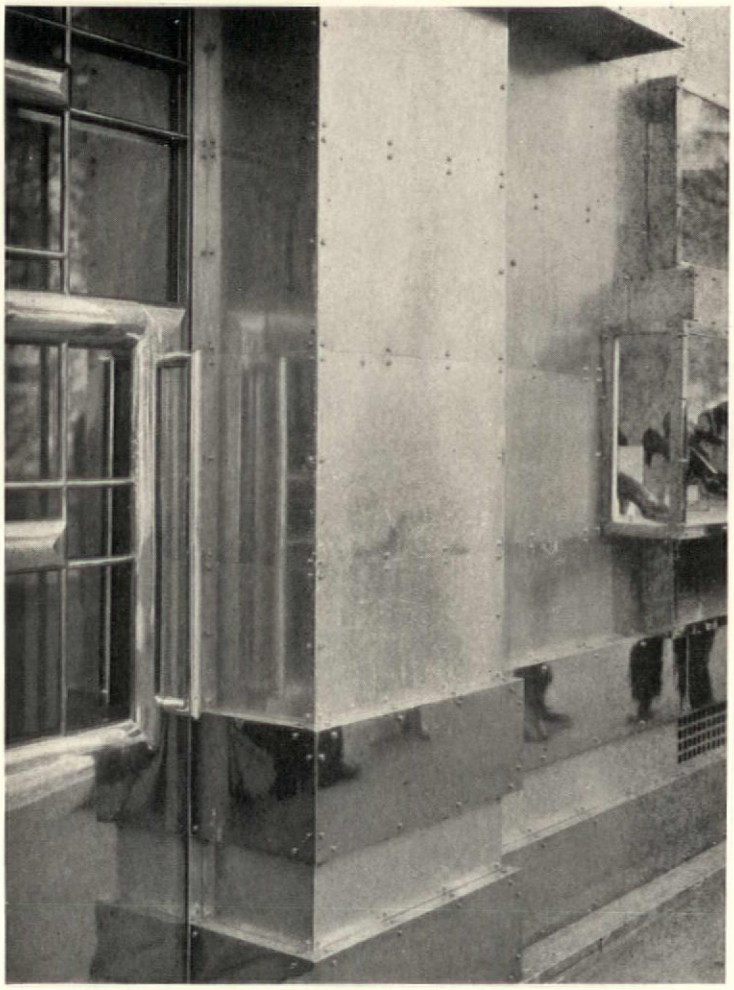
PHOTOGRAPHS AND CAPTIONS BY GERALD K. GEERLINGS



*45 Boulevard Haussmann. The outer window frame, sill, base course, and basement "mullions" are of white marble with black veining. Basement grilles are dull silver in color. The broad expanse of gray semi-opaque glass above the show window is mottled, and not quite smooth. The circular sign has a silvery rim and letters, against an imitation mother-of-pearl background*

*Shoe shop, Boulevard de la Madelaine, a combination of polished steel with sheet brass. The simplicity and unexpected color are both good architecture and good advertising. All is steel, except for the brass base course and the band immediately below the window. Lights and reflectors are housed in the projecting soffit overhead*

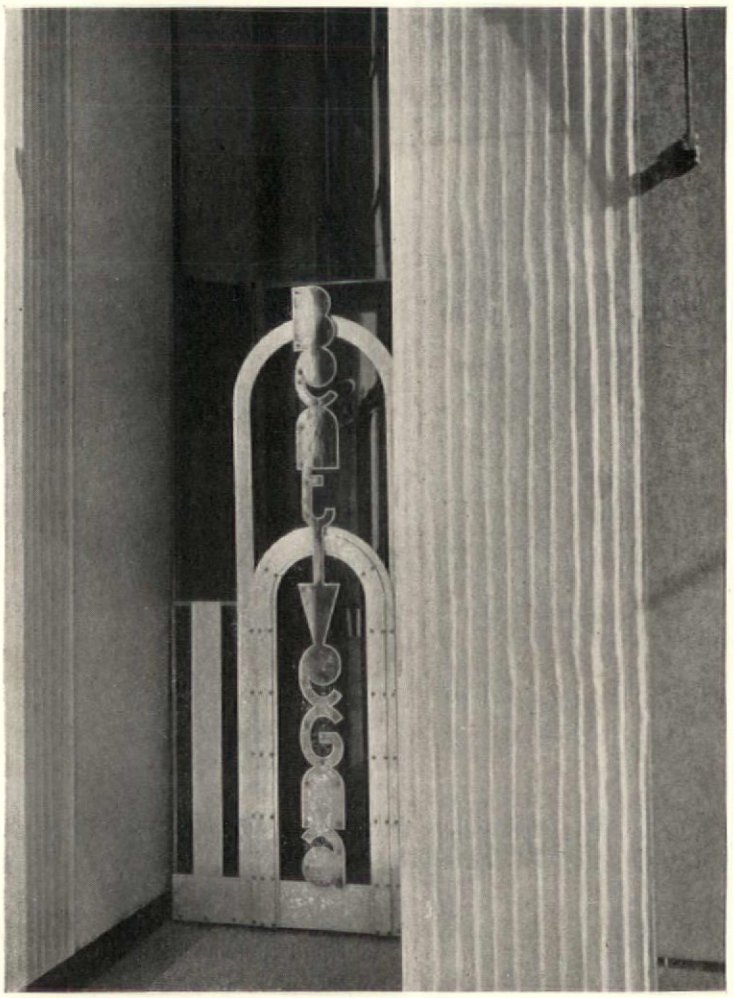




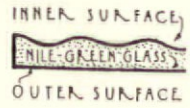
*A detail of the Bally shoe shop, showing the two projecting brass courses at the base, and the end of the show window "set-backs." The steel plates are flush, and are held in position by cylindrical rivets (see sketch). The door is brass in color*

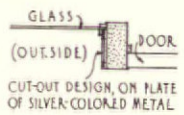


*Rue de Faubourg Saint-Honoré. (Maurice Bizet, architect.) This design comprises a versatile union of: two Paris houses with different floor levels, the requirements of an expensive shoe shop, and a design influence imported from perhaps the vicinity of the Nile. The entrance motif is of Nile-green glass ribbed underneath, with an opaque glass panel above the entrance. The show windows have plain facias of mottled gold finish; the window backs have old-gold background and drapes, with the sides in two shades of wide yellow stripes. The base band and signs are lacquer red*



*A detail of the Nile-green glass pilasters, which are ribbed on their under surfaces and smooth on the outer. The base band is lacquer red. The door is of clear glass, having an aluminum-colored metal appliqué design superimposed, and highly polished brass letters spelling "Bentivegna"*





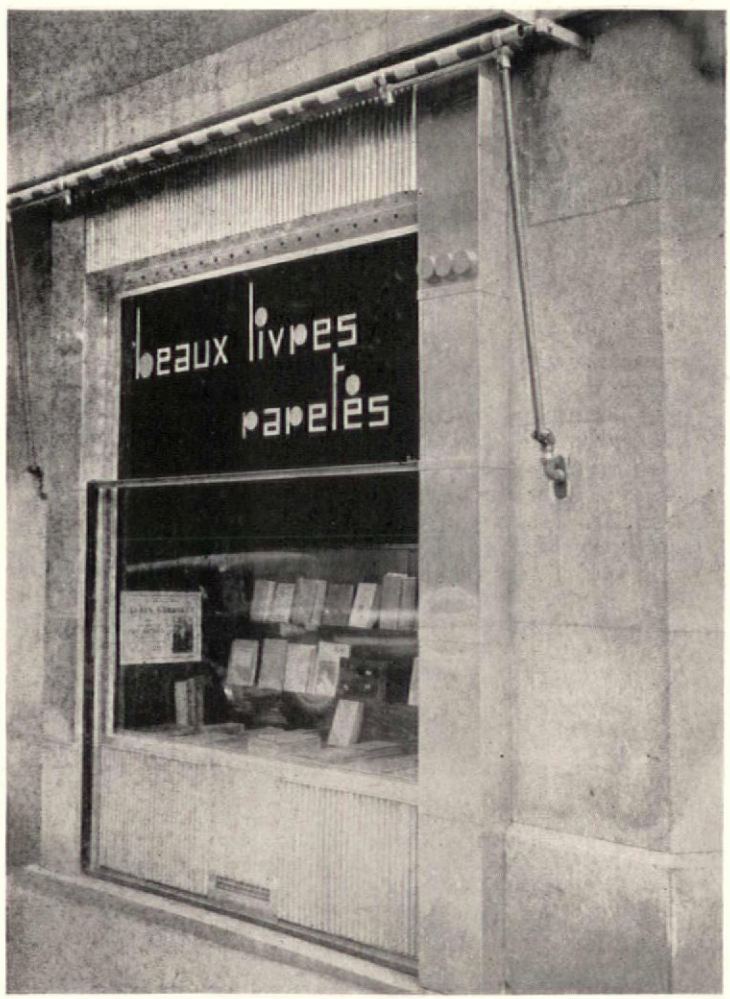

*Rue Pépinière. The jamb reveals of the door project several inches beyond the face of the glass of the show window, and are built up of a sheet of perforated metal applied to a solid facia (see sketch). Within the scalloped enclosure surmounting the door, and on the letters of the name "Weil," there is red tubing which is illuminated at night. The banded pipe columns at the sides are silver in color; the base of the show window is black marble*




*Rue St. Florentin. In this conservative rendition of the modern, the T-square and triangle have seemingly played a major design rôle, but for an economic performance it does creditably. The color is particularly pleasing: the marble surrounding the window is white and red, rosy in effect, the base is of gray marble, the step of small red-and-white tile, and the metal, silver in color. The presence of the second-floor windows were an unfortunate circumstance for the designer, certainly*

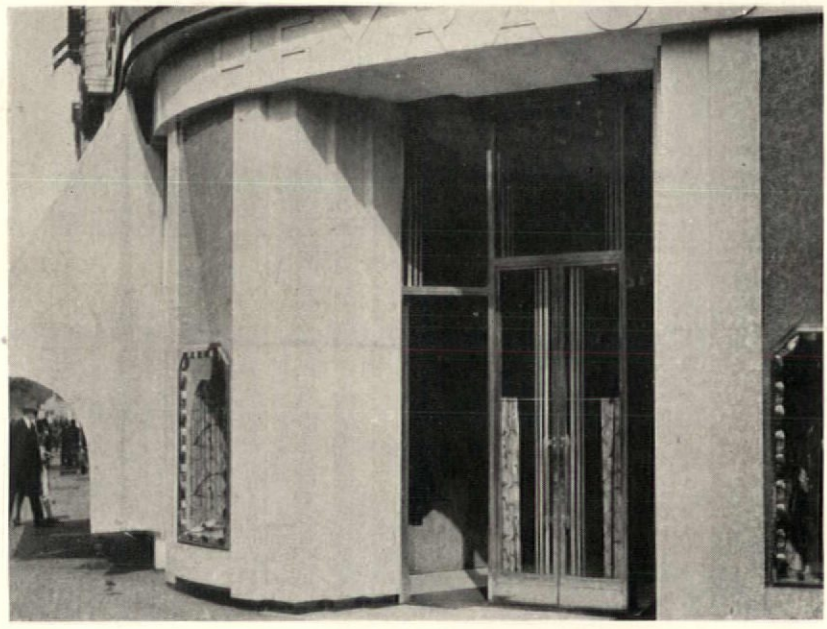
*Boulevard Raspail. Here again the Parisian fondness for simple designs in sheet metal asserts itself. The building is of gray-buff limestone; the metal, polished silver in color. The color effect is splendid in reality, but unfortunately it does not record in a photograph. Inside the window, the wood sides and shelving are stained black, and so rubbed that the long coarse grain counts as an interesting over-all whitish design. The vertical metal ribbing in the metal below the window is a half inch in depth*



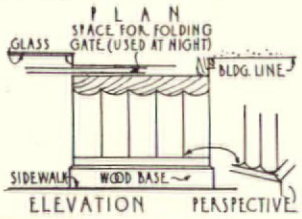


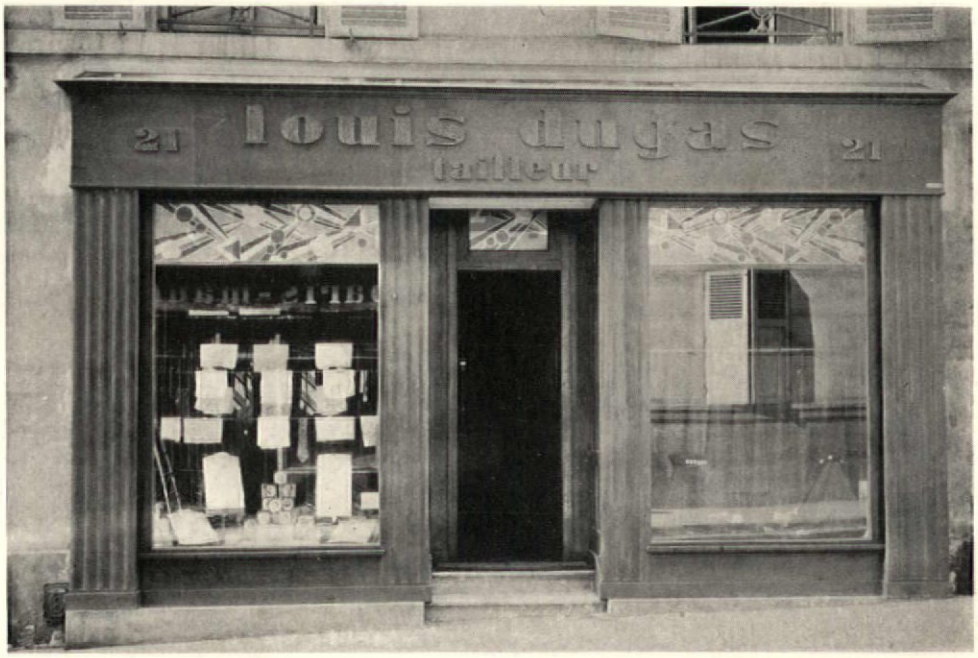

*Rue Royale. Another example of the success which attends the simple treatment of a well-designed marble frame for the modern show window. This shop maintains an air of distinction on the wide Royale, which many of its more fripperied neighbors lack. Only black-and-gold marble, and bronze window frames, have been used, but the profiles of the marble offsets are more effective than broadcast ornament*



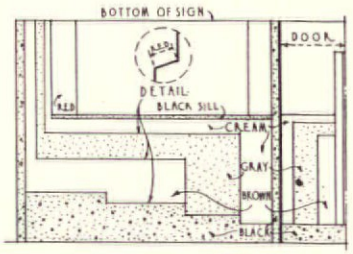
*Boulevard Haussmann and the rue Lafitte. If the modern movement has done nothing more than to make us realize the possibilities in shade and shadow, it has achieved sufficient to justify some of its errors, at any rate. In this example, instead of meaningless pilasters there are simple offsets in the jamb which help to focus the interest on the actual window and entrance door. The jambs are of white marble, slightly streaked with gray; the cornice facia is of dark gray marble, with the soffit of sheet bronze; the base of black marble; the window frame is of highly polished bronze*

*21 rue du Val de Grâce. An admirable adaptation of the historic in terms of the modern—simplifying pilasters and entablature so that they become secondary in importance to the merchandise display. The wood has been only lightly stained and then waxed; the etched glass patterns in the transom and upper part of the windows fall below the standard of the wood details (see sketch). (In the right-hand glass a window with shutters is reflected from across the street)*





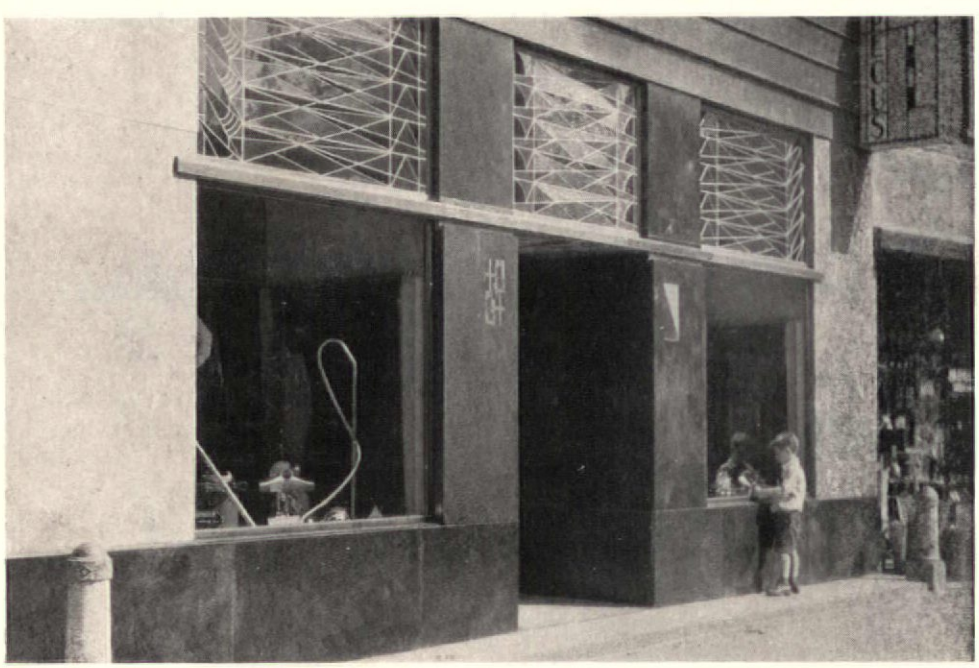

*Corner of Boulevard Raspail and rue Brea. (N. Vidal, architect.) Only a color photograph could do justice to this merry café. The frame of the sign is black with inner and outer red margins, the background is cream, the letters black and red. At night illuminated red tubing defines the outline of the letters. The windows have frosted glass, red mullion columns, black sill and lettering. Below the window the wall is painted as indicated in the sketch*

*Shoe shop, "Centraal," The Hague. This shop is more interesting for the idea it suggests for lighting, and the splayed entrance, than its intrinsic beauty. At night the space above the shop is illuminated, both the ceiling panels and the prisms toward the street. The stepped-back sides of the entrance give a sense of welcome, without the cluttered, complicated appearance of many cheap shops in America. The framework of the shop is dull oxidized bronze; the lettering and window mullions polished bronze; window base is black-and-white marble; the glass "band courses" above the show windows are semi-opaque glass with small spots of blue; the upper flanking signs are blue-and-white glass*

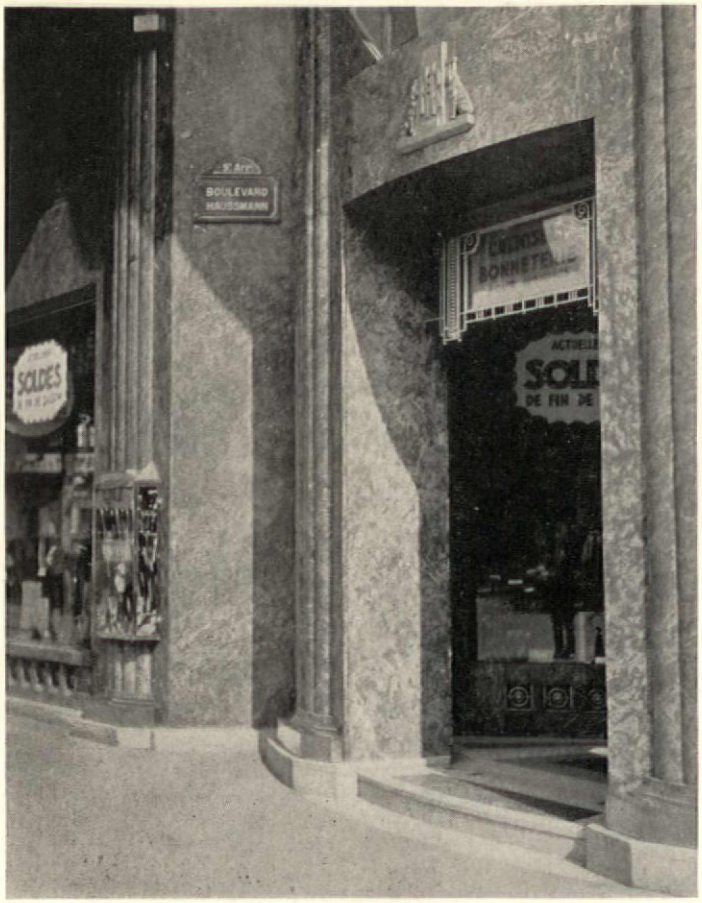








*Shop on the Oude Gracht, Utrecht. A good example of the modern shop which depends more upon simple forms and color than ornamental abundance. Here there is a range of marble treatment due to the variety in finish, being sometimes honed, again roughened, and only occasionally polished. Corner piers are of gray marble, honed; base and entrance jambs are greenish black, highly polished, except for the shields which are definitely tooled. Above the show windows is opaque glass in black, tan, and yellow. Between this colored glass and the second-story window sills is a version of wood siding, painted a color between orange and tan*




*Boulevard Haussmann. Another example where the designer has taken advantage of shade and shadow, instead of relying on small-scale ornament. The corner entrance is on a gently curving sweep, with the variety of lighting further increased by the simplified pilasters composed of five curved, ribbed segments. The marble is a pleasing gray with pink veining; the metal work, including the shield over the entrance opening, is bronze*




*Rue de la Paix. (J. Marrast, architect, 1928.) In this case the designer was faced with the difficult problem of maintaining the existing pilasters which divided the shop into two. The accompanying sketch shows how cleverly the approaching pedestrian is led into the shop with the door at an angle. Above the door the squared decorated area has frosted glass with a rose pattern set in a gilt frame; surrounding the small show window proper is a composition material in black and gold; the door and the base grille are of wrought iron*




*Rue de la Paix. Even without the name of the London house one could almost know for a certainty that this restrained front was an English version of French modernism. For the unextravagant shop front which favors conservatism, this design may contribute a few suggestions. Black-and-white marble supplies the outer frame, door stiles, and jamb reveal, while the windows are surrounded by cream-colored marble with gray veining. The window muntins and letters forming the name are of bronze; the door and the upper windows are apple green in color*

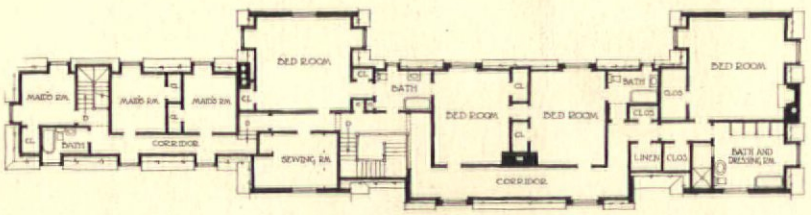


*Photographs by Robert MacLean Glasgow*

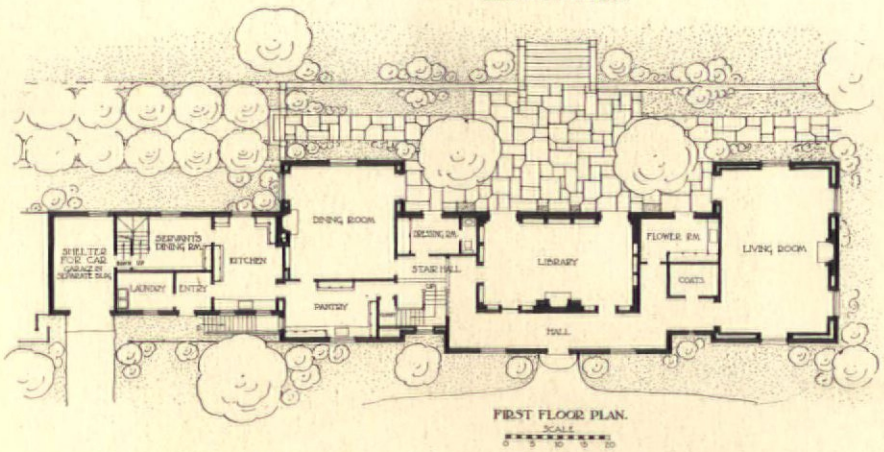
# House of Benjamin A. Mosser, Morristown, N. J.

## GREVILLE RICKARD, ARCHITECT

*The house is built of a common brick with raked joints, liberally supported by cast concrete blocks in the quoins, on the gable rakes, and elsewhere. The roof is of variegated red flat tile*




SECOND FLOOR PLAN.



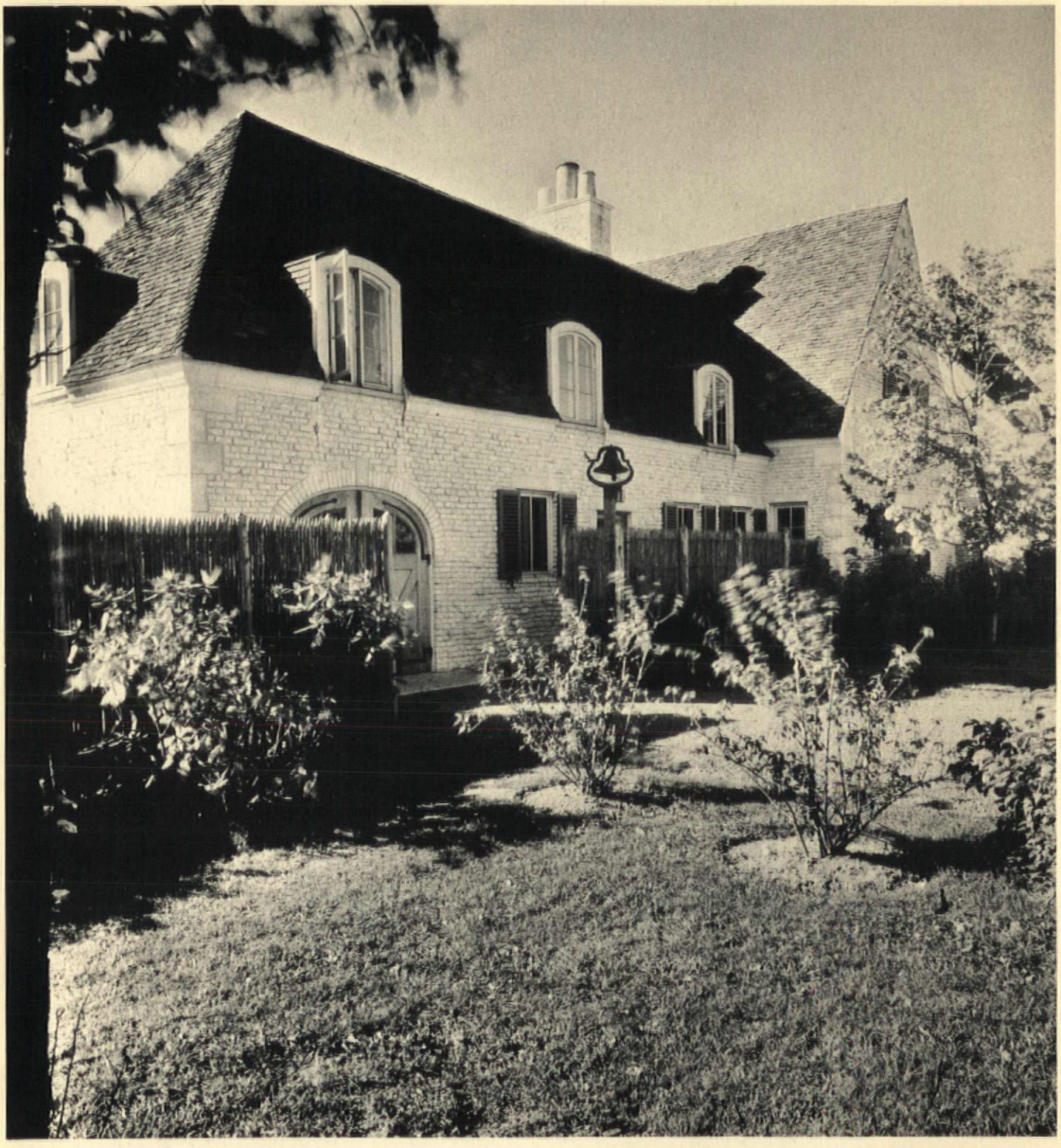

FIRST FLOOR PLAN.



*A local field stone is used for the first-story walls between the bays; this, the brick-work, and the cast concrete being covered with whitewash in which there is a trace of yellow ochre. The terrace paving is of variegated flagstones*



*A view taken sharply across the terrace front. For the garden walls, brick capped by flagstone has been used. Shutters are blue-green, woodwork white. Wood casements are used throughout*



*The service wing, with the garage space for a single car—there is a separate garage building elsewhere on the estate. The dormers are roofed with copper, the cheek walls being formed by the roof tile, carried across in corresponding courses. Garage doors are of natural oak. Chimney pots are natural clay color, darkening through use*



*Above, the library, the walls of which are of gum wood finished with a light stain, maintaining almost the natural color of the wood. All bookshelves, it will be noted, are fully recessed*



*A corner of the flower room, in which a brightly colored wall-paper has been used and shellacked. The floor is of linoleum, and the sink of monel metal*



*A view through the long hall looking towards the stairway. The ceiling beams are of roughly hewn oak, the floor of oak planks, and the plaster, hand worked with an integral brown coloring. To the hangings is entrusted the task of providing strong color*



*In the dining-room the plaster walls and the woodwork are painted. There is an interesting detail here in the sawn window heads, made to cover the curtain rods. The radiation is concealed under the broad window sills*



*Detail of the main stairway, entirely of oak. The millwork has been given a very light stain as compared with the darker one of the rough-hewn timbering*



*The master's bedroom as shown in a photograph which unfortunately does not include the fireplace in the right-hand wall. The plaster walls are tinted as a foil for the bright chintz colors on hangings and furniture coverings*

*The building in the foreground is the garage, built throughout of the same materials as those used in the house itself*



# Organic Structure

## *By Carleton B. Ryder*

*Copyright, 1933, by Carleton B. Ryder*

"Yet, is it all one."
—*Translation of "Black Marigolds" from Sanskrit of Bilhana, by Edward Powys Mathers.*

*The reader may as well be told, before he finds it out for himself, that this is hard, slow reading. An analysis of the essence of architecture, and of the curious, distorted relation that has grown up between art and science, is, necessarily, not to be dished up as midsummer fiction, or even as sparkling entertainment. You are warned.*—EDITOR.

IT has been said of the late Charles H. Moore, Professor of Art at Harvard University, that he was the first to bring out strongly and clearly the "*organic* structural character of Gothic architecture."

To those who seek the reason in things, that realization is inescapable. *The logical structure is organic.*

In the past three articles of this series the reader has witnessed the advocacy of a Naturalistic, otherwise "Organic," conception of interior design. It has been typified by proposed treatments of Acoustics, Air Conditioning, and Lighting. But let the reader attempt to apply each of those three theories to the same interior, and he will find that he lacks something as important as it is difficult to define. He will realize that the naturalistic, or the physiological aspect of organics are only patterns of a principle, results of the process that shapes a logical structure's growth.

That principle is the indispensable staff of practice. It is the law of Organization: *Consistency.*

Today, the architectural mind is called in a thousand divergent directions. Financial stagnation and conflicting solutions have left him confidence in little or nothing. So the writer is perfectly aware that it is to a righteously dubious audience that this paper is addressed. He asks that the reader accept nothing but the evidently logical in the arguments to follow. If such logic is coherent he will have proved:

First, that the period has exceeded its application, not surpassed its necessity. It lacks only the interpreter, the Organic Technician.

Second, that only by organization may architecture become a logical fabrication of the needs of the occupant—in short, Organic Structure.

Third, that commonplace use of that technique is the immediate privilege of the architect.

### Definitions

The Organic principle, like many another abstract, is most evident in absence, but this characteristic is little help to the study of it. We are setting out to prove the above by examination of that principle, and its workings. Our first move must therefore be to trace its reappearances through an historical sketch of architecture. We then will have the means to its definition in terms of its effect. From the effect we can deduce the cause.

As the result of this method of reasoning we find that:

1. An Organic Structure is the effect of an Organized Cause.

2. The law of Organization is Consistency. But the fullest significance of that word must be understood.

For instance, architecture permitted an inconsistency when it attempted to associate Science and Art, although uncertain as to the relation of the two, or indeed, doubtful as to the existence of any relationship. The structure could not be consistent, could not proceed in every stage of development from a cause to an effect, and achieve a unity, if any two factors were unrelated.

It is characteristic of this most important lack of relationship that about a thousand years ago a condemned Persian poet struck off the coin of truth, the ultimate assay of subsequent doctrines, that heads this article.

In other words, the universe may be resolved into a single principle, possibly that known as energy, of which matter is simply a more finite form. The single structure of science has been erected upon one sound fundamental, *i. e.*, that its coin must be the product of knowledge. And every important step of science points toward such an elemental oneness of all phenomena. The theory represents the utmost in simplicity by the very fact that it excludes the irrational. Inconsistencies cannot exist in a unit.



But two things have happened to nullify the value of Science's example.

First, Science, although its objective is the sociological increase of Man, has been so wrapt in its coils that it is forced to leave its adoption to Man himself. The latter assumed Self to be the exemplification of Man, rather than its smallest unit. So he justified the literal application of Science to the increase of Self. The two are not the same, hence the result is inconsistent and illogical. The admission of this inconsistency, like a fault in the foundation of a building, has cracked every wall.

A second inconsistency was the illogical path of Art.

Although we credit the Persian poet with the minting of the coin of truth, "yet is it all one," we must add that in the same breath he concluded, "yet is it nothing." He had called upon Art to witness his amazing dexterity at counterfeiting the coin of truth with the coin of artistry; pathos.

Pathetic, to say the least! Art apparently went away with no very clear impression as to which was the counterfeit, for its works and its wealth have only been restricted by its artifice. Built indiscriminately upon truth and error, its structure crumbles about as fast as built.

Science and Art are simply different ways to the same end, truth, but the difference is important. Science forbids exceeding knowledge, even though the lesson lags behind, while the artist often tries to make his point clear by overexpression. If his point is the apex of his knowledge, the excess may not be true.

Thus, throughout our review of architecture, we can trace every fault to a lack of consistency, principally in the loose association of Science and Art.

In this light our earliest structures were the nearest to organic, because they proceeded most directly and consistently from their cause, a need of the occupant. Then, with the growing complexity of the occupant, the unbridged initial fault was lost to view. The checks that sprang from it spread. Later cementings only divided the stress and forced the crazing further. Finally the isolated fragments of architecture's structure became the platforms of Style, the worst enemy of Organization.

Style is the propounding of an incidental unit as the universal measure. Just because the advocate of a style is cut off from the whole, he assumes his particular propensity to be the bricks of which the whole is built. One style may best suit one need, but only all styles can suit all needs. Since no two needs, more than any two men, are exactly duplicate, style is the stamp of creative poverty.

At this time we are confronted with the shame of finding ourselves out. Inconsistency on every hand has led to dismal confusion. Arbitrary canons and coinage, we find, cannot help us. We must, and we will, migrate to the only path out of the maze: *the way we came*. We must return to the simple law of Organization, Consistency, and practise it by associating only those things whose relationship can be found in a common cause.

Our structures will then proceed logically from an organized unit of cause and materialize as organic forms of theory and substance.

In summary of the first phase of our argument, recognition of the Organic is not its achievement, neither is appropriation of its forms. It is not modernism, classicism, nor any other "ism." Yet it is older than all, for it has been responsible for the elements of logic in each. It has been submerged in proportion to our conflicts; literally lost in the rift between Science and Art, because Organization is unification. We must therefore learn the relationship of every fundamental to its fellow before we attempt to relate them.

The naked knowledge that "it is all one" must be our assurance and encouragement that such relationship can be determined.

## PROCEDURE

Our next step is to show how the principle of Organization applied to Architecture will produce an Organic Structure. Also that it is the most direct way to that end.

Consistency first requires a definition of the beginning and end of architecture.

Consistency requires a cause to produce an effect. On delving deeper we find that any cause is the effect of a still more elemental cause. The process is one of constant refinement. The present material effect of a process is only the stage of development that time has permitted its cause to reach. That material effect may be the nucleus of further development, while still the complex effect of a prior cause.

Consistency requires that a cause continue to generate effects until it is overcome, or limited, by a counter cause. By reason of its relation to the generating nucleus, this counter-cause can be likened to an envelope resisting the expansion of the nucleus.

But consistency with the idea that there is only *one* fundamental cause forces us to the conclusion that the only permanent envelope to a generating nucleus is its *rate of progress*.

Architecture, to adopt more tangible terms, is the product or effect of the nucleus, Man, and the envelope, Economics.

The often forgotten fact that Man, in the generalizing sense, or the occupant, in particular, is the sole creative cause of the house is the first result of this reasoning. The second conclusion is that architecture cannot grow, at least in conception, otherwise than outwardly from the occupant, and will thus grow in accordance with its rate of growth, Economics.

A definition of Economics may serve to make plainer the allusion to it as a rate. It is definable as the sum of methods by which conditions of life may be maintained or improved. It represents the speed with which natural and social obstacles to living are overcome. Consequently it is the tangible evidence of Man's rate of progress.

The only obstacle Man cannot conceivably overcome is his own "slowness."

Thus an analysis of Man, alone, must disclose not only the nature, but the relationship, of every factor contributing to a logical architecture. Then a co-ordinating agency can design that which the occupant would cause.



If the analysis of Man is confined to the simpler, purely physical, factors we see him as a parcel of wants impelled in pursuit of satisfaction.

Elementally these wants, instincts, appetites or motives are really few and simple. They seem entirely reducible to hunger and thirst, respiratory, thermal, recuperative and erotic appetites. They may even be reduced to the major underlying motive, perpetuation of well-being. But these few motives are the fulcrum upon which the ponderous pendulum of society swings. The smallest inconsistencies there will cause wide eccentricities in the arc.



The nature of the want is detected by innumerable subjective sensory endings, like antennæ, located throughout the body. These may not operate consciously. Association compounded upon association may result in the want reaching consciousness in terms of environment, society, and habit so remote from its instigation as to bear it no apparent resemblance. But the brain or nerve centre has, in the process, transformed the want into a sort of motive force.

The motive enlists the seven or more types of objective perceptors that are in contact with the source-of-supply of satisfaction. These are the visual, auditory, olfactory, gustatory, tactile, thermal, kinesthetic mechanisms. If the means of satisfaction is at hand, they report back to that effect, and the motive is redirected to attainment under their guidance. If the means is not immediately evident a "trial and error" course is adopted until such means is hit upon.

This may not take place outwardly but by what, through lack of space, we shall have to call "reasoning," with "experience" to guide. Rambling as the detour may be, the process will eventually reach one of the elementary want satisfactions, and the motive actuating it cease.

Such a purely physical analysis of Man is common knowledge to the physiologist. With the physiologist's prescription in quantitative form, the specializing engineer can offer precisely the degree of satisfaction a man requires of his environment.

These physical means of satisfaction that comprise the skeleton of Organic Structure are, consistent with their causes:

1. Devices for promoting ingestive and metabolic functions.
2. Air-conditioning devices for promoting respiratory and thermal functions.
3. Physical accommodations for promoting rest and action.

4. Devices for promoting efficiency of sensory functioning, such, principally, as lighting, acoustics, and textures.

From the specializing engineers, these means of satisfaction proceed into applied form. But—and hereon depends the consistency of the whole organic structure—*these satisfactions must be jointly applied in the same proportions of respective importance as their causes, man's physical wants.*

The comprehensive understanding, from physiology to applied engineering, entailed in such a technique of co-ordination, is our first argument for a specializing agency, the Organic Technician.



So far, we have traced the logical growth of Organic Structure to the limits justified by elementary physical causes. We have avoided all complicating esthetic considerations until certain of their relationship to the physical.

The relationship of the physical and the esthetic is found to exist, and its character disclosed, by a second analysis of the nucleus, Man.

This time our method involves procedure from physiology to elementary psychology. Its logic is the most important phase of the argument, because it indicates a sound method of bridging the worst fault of architecture—loose association of Science and Art.

The workings of the complete neural system have been very logically reduced to physical processes by the late Doctor Leonard T. Troland, psychologist, and others. Their well-substantiated "Dynamic" theory of psychology is, in brief, much as follows:

All primary, subjective and objective, neural activity is accompanied by a secondary activity. This latter is a constant cross index of advice, favorable, neutral, or unfavorable, and respectively termed positive or negative.

Since the energy exciting the neural system has been found to abide by certain of the laws governing electricity, let us adopt an electrical analogy. Let us assume that a transformer having two windings is coupled to two circuits. The first of these is an open circuit excited by external currents. The second is a closed circuit with a fixed current, such as a battery. But this second circuit is so reflexed that its excitation is partially "fed back" into the first circuit. Now an external current may be of two types. First, that which is in phase with the current of the battery circuit, in which case the "feed-back" coupling will cause the intensity of the entire excitation to build up with time; second, that which is of opposite phase to the battery current, in which case the fed back excitation will tend to suppress or cancel the external current.

Let the fixed battery current represent the normal psycho-physiological balance of man. External currents represent physical needs (deflections of the organism from its median of balance). The circuits represent neural channels and the transformer represents the brain or nerve centre.

Then primary neural activity is accounted for by the first and second circuit; secondary neural activity by the reflex coupling. The circuit would appear to remain inactive except while stimulated by external currents, our familiar wants. Then the augmented or suppressed activity would be of intensity proportional to the time it lasts.

But in our electrical analogy we inevitably have to allow for more or less core-saturation of the transformer. This means that extended or exceptional excitation of the same phase will cause an *opposite phase* charge in the presumably inert transformer. This will discharge back into the circuit, suppressing its cause while that lasts. Its slower rate of discharge may result in its outlasting the cause. In that case it would appear as a favoring or suppressing tendency for later external currents, favoring their opposite phase and suppressing their similar phase. After the cause had ceased it might also appear as an independent internal or tertiary excitation of opposite phase to its cause.



Our complete neural systems act very much in this way. Both favorable and unfavorable primary and secondary intensity builds up to a certain level and then suffers a relative decrease when the time is further extended, exactly as though opposed by a tertiary activity that has been slower in accumulating.

This accounts for the four characteristics of Man that comprise the esthetic wants:

1. Acclimatization or decay of interest in the attendant.
2. Antipathy for the customary.
3. Favoritism for the different.
4. Appreciation of the abstract.

The first three either accompany a physical cause or follow closely enough upon its heels to be analyzed through such cause. But the fourth may be the accumulated aftermath of many

physical causes, and too remote from them to be traced directly. Yet it is the most important to us, because it represents non-physical, or artistic, wants.

It must be understood that this fourth effect, after discharging into the neural system, excites it in the same manner as a want, but since it originates in the brain, or the transformer, is untraceable to subjective cause and must remain an *unnamed*, or *undiscriminating*, *want.*



The more promptly our wants are satisfied, the more insistent becomes the unnamed, esthetic want.

Thus a relatively constant dissatisfaction is the basic force motivating Man, our nucleus of Organic Structure. If it were not so he would merely fluctuate about his median of well-being. But—and this is the most encouraging conclusion—as it is he is constantly impelled to something better and *even the median is pulled to a higher level.*

The obvious conclusion is that the physical and the esthetic are definitely related; the former is the cause of the latter effect. *The time involved in deriving physical satisfactions is literally the measure of the esthetic want.*

We have only to find out what will satisfy an esthetic want.

The esthetic want, being an after-effect, may be making its demand for satisfaction in the total absence of physical want. Hence a physical satisfaction would be an excess, unfavorable and unsought. The only satisfaction that will meet esthetic requirements is one of physical appearance but no physical effect. It must be as purely mental as the want. Only promotion of others' well-being, and esthetic self-enjoyment, meet the conditions.

Benevolence and art are the means of esthetic satisfaction.



This second analysis of Man is within the accepted realm of the psychologist. His findings are the material assurance that the work of the designer and artist are not merely related, but essential to complete Organic Structure. Such findings also conclusively indicate that the importance of esthetics, in relation to the physical, will be apparent in analysis of the time intervals involved in physical satisfaction. Furthermore, that esthetic want may be controlled by regulation of such time intervals.

The esthetic means of satisfaction that clothe the skeleton of Organic Structure may now be reduced to applied form as:

1. Devices for temporal change of environment.
2. Devices for mental, sensory, and physical recreation.
3. Artistic presentations.

These must be applied in proportion to the intensity of the esthetic want, as measured through physical activities, and thereon also depends the consistency of the entire Organic Structure. This carries the understanding required of the co-ordinating agency from physics through to esthetics.



In summary of the second phase of our argument, we have shown that only an architecture proceeding from the occupant can produce a logical environment for him—Organic Structure. If this is the only logical procedure it must be the most direct. By progressive analysis of the occupant we have shown that, from the physical to the esthetic, from Science to Art, such structure can grow consistently because a definite relationship exists. We have shown that the structure must comprise physical satisfactions as required by physical wants, and esthetic satisfactions as required by esthetic wants. These must be co-ordinated in structural effect as they are related in human cause. We have made obvious the necessity for a co-ordinating agency and the extent of his requirements.

## PRACTICE

It only remains for us to point out our reasons for saying that the technique of Organization is the immediate privilege of the architect.

By necessities of space we have so far generalized in treatment of the subject. But, as we have said that no two men are exactly duplicate, so, in practice, no two organic structures are likely to be the same, for each is the effect of its cause, the occupant.

The first move in architectural practice of Organization is to segregate the occupant, collective or individual, for particular analysis. The analysis is carried out in consultation with a physiologist and psychologist. Their conclusions become the property of the specializing

engineers. The products of these are turned over to the designer and artist. When the housing stage has thus been reached, the structural engineer formulates support, and the architect designs the mass.

But we have not forgotten the envelope, Economics. The requirements of the outer world and their social reflections in the occupant combine as the result of a second analysis of Man in general. Then reversely down the line of development outlined above these specific restrictions are applied.

This is the order of practice whereby the law of Organization, Consistency, may achieve an Organic Structure. It is neither impractical nor remote. It is both logical and available to the architect.

In "The Neglected Sense," the first article of this series, the importance of consistency in psychological considerations was brought out by a discussion of acoustics.

In "Fair Weather," the second article, the importance of consistency in physiological considerations was brought out by a discussion of means of maintaining the body's thermal balance through air conditioning.

In "Material Vision," the third article, importance of consistency through physical considerations was brought out by discussion of the reactions of the eye to light and color.

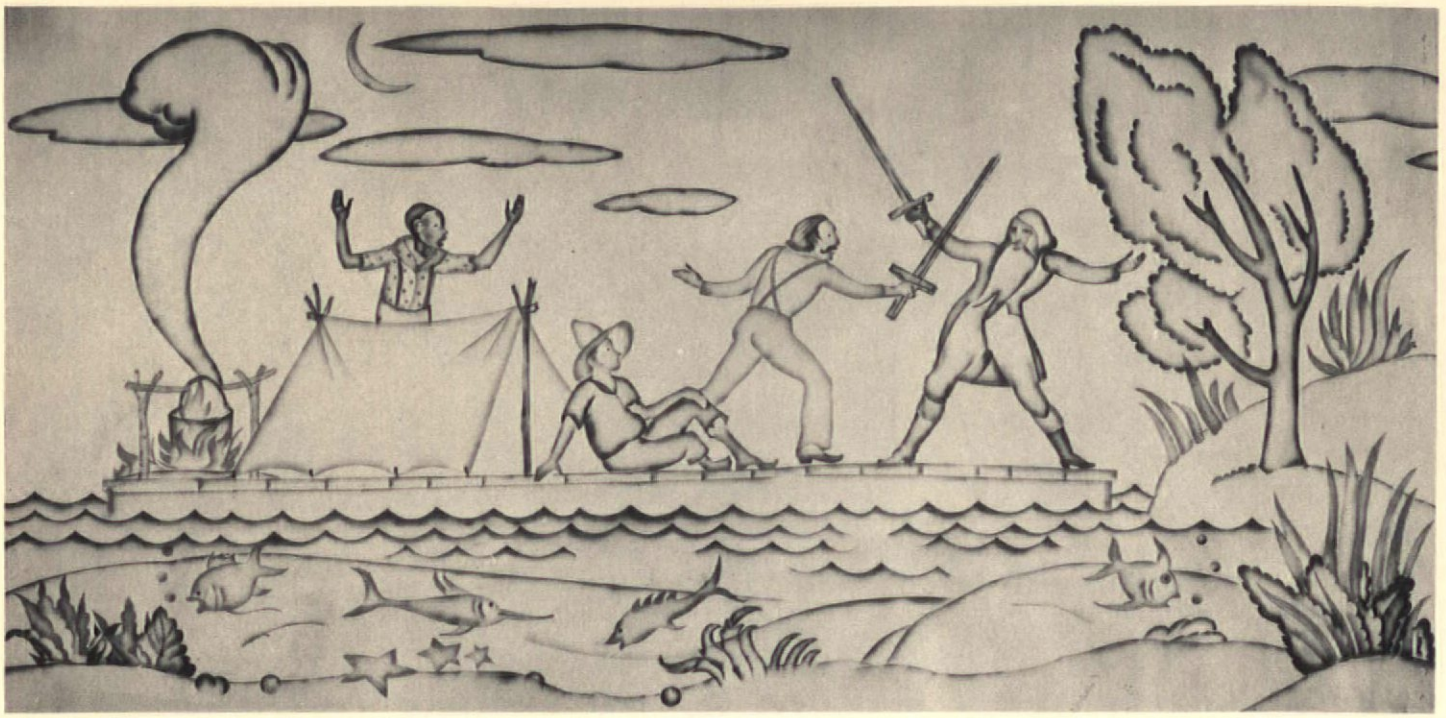
In each of these consistency alone has indicated logical improvements.

The purpose of this article has been to prove the importance of consistency in the co-ordinating of each phase of every field for production of a logical architecture.

The reader, who may now consider applying the theories advanced in the first three articles to the same interior, will realize that Consistency has acquired a tangible, useful meaning. He will have a real conception of the possibilities inherent in Organization.

*Note.*—The author wishes to express his gratitude to those who, by generous act and encouragement, have been much more than sources of reference: Erastus Root St. John, M. Am. Soc. C. E.; Vesper A. Schlenker, acoustical research engineer; Harold L. Hadden, electrical engineer; Wallace D. Van Etten, architectural designer; Perry West, air-conditioning engineer; Dr. Leonard Greenberg, School of Public Health, Yale University; Dr. C. P. Yaglou, Professor of Industrial Hygiene, Harvard University; Dr. W. J. McConnell, A. S. H. V. E.; J. W. Barker, Dean, School of Engineering, Columbia University; H. E. DeAndrade, illuminating engineer; A. L. Powell, Chairman, I. E. S. Committee on Light in Architecture; Alston Rodgers, illuminating engineer; Dr. C. E. Ferree, Wilmer Ophthalmological Institute, Johns Hopkins University; Dr. J. A. Jastrow, psychologist, New School of Social Research; Dr. L. P. Herrington, psychologist, John Pierce Foundation, Yale University; Dr. D. A. Laird, Director, Psychological Laboratory, Colgate University; Thomas Wilfred, artist in light; Gifford M. Ryder, artist; Edna M. Treadwell, medical technician.





*Photographs by Peter A. Juley & Son*

# The Adventures of Huckleberry Finn

*Painted by D. Putnam Brinley*

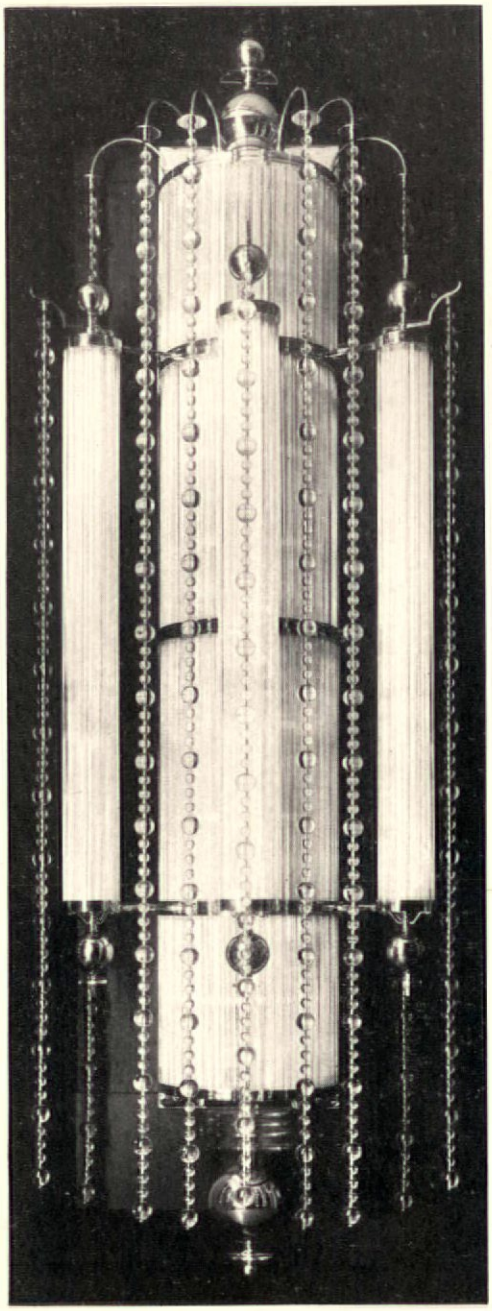
*Mr. Brinley's murals are on the walls of a cafeteria in the new Home Office Building of the Metropolitan Life Insurance Company, New York City, for which D. Everett Waid and Harvey Wiley Corbett were the architects. Mr. Brinley had a large area to cover in a short time, and developed a new technique involving the use of cutouts, along the edges of which he painted with an airbrush. The series is marked by a freshness and naïveté that is evident from the portions here reproduced, handicapped as they are by our failure to reproduce the color. The incident represented above is: "The king and the duke got out a couple of long swords made out of oak laths and begun to practice." At the bottom of the page, "By the living Jingo, here's the bag of gold on his breast!"*

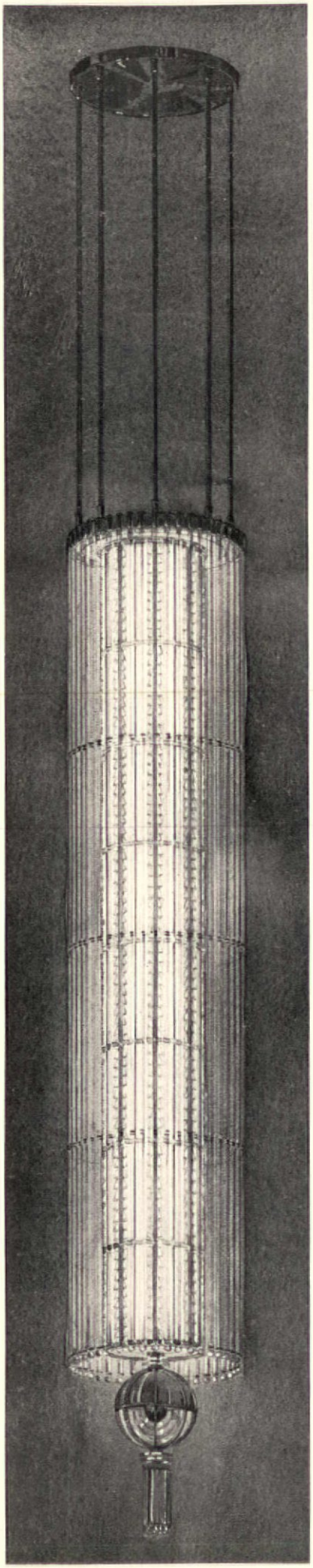


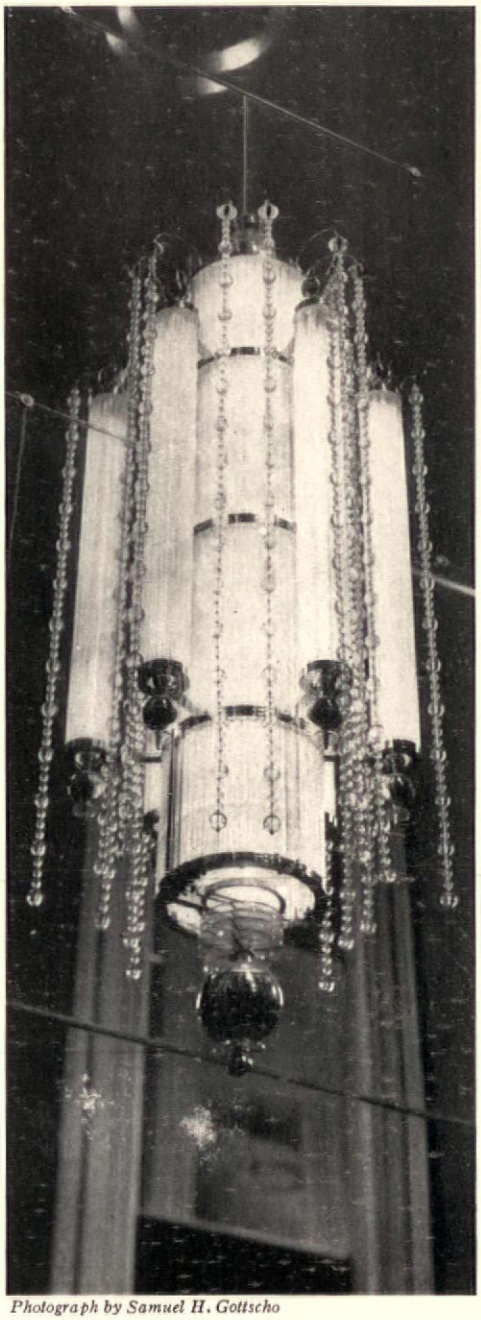


*"It's you at last, ain't it?"*









Photograph by Samuel H. Gottscho

## Lighting Fixtures

## Rockefeller Center

*In the centre, one of the large chandeliers in the grand foyer, International Music Hall, developed by the architects: Reinhard & Hofmeister; Corbett, Harrison & MacMurray; Hood & Fouilhoux, in collaboration with Edward F. Caldwell & Company, Inc., who executed the work. The total length of this fixture is about twenty-nine feet, and there are many intricate provisions, necessarily, for safety from falling and from glass breakage.*

*At left, one of the side-wall bracket fixtures in the main foyer, and at the right, the same fixture in place, engaged on a mirror surface. There is a Viennese sparkle in this fixture, modern and functional as it unquestionably is in its combination of heat-resisting glass and chromium-plated metal*





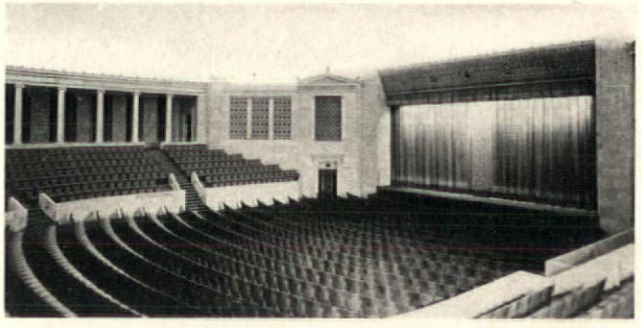
*The new Parliament Buildings for Northern Ireland, built of Portland stone on a granite base. Sir Arnold Thornely, architect*

# Architectural News

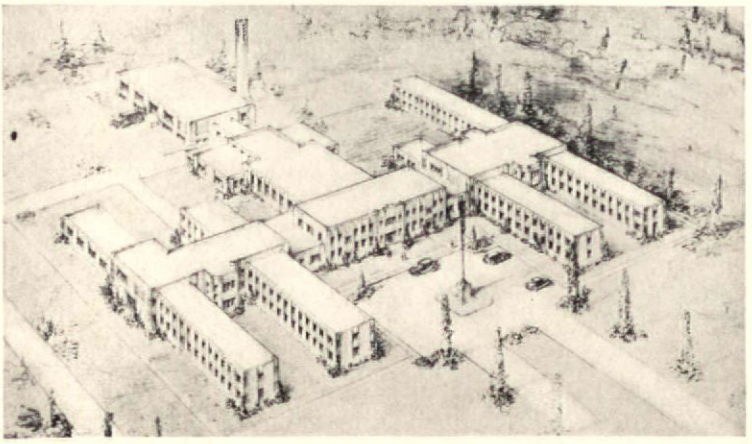
*Preliminary perspective of the proposed United States Customs House and Appraisers Stores Building, to be erected at Second and Chestnut Streets, Philadelphia. Ritter & Shay, architects*



*Proposed Federal House of Detention, which is to be erected at Sandstone, Minn., the design for which was won in competition by Ekman, Holm & Company, architects and engineers.*



*At left, one of the two new wings of the Toledo Museum of Art, recently opened—a bequest of the late Edward Drummon Libbey. Above, the 1500-seat concert hall, a modernized version of a Greek open-air theatre. Edward B. Green & Son, architects*



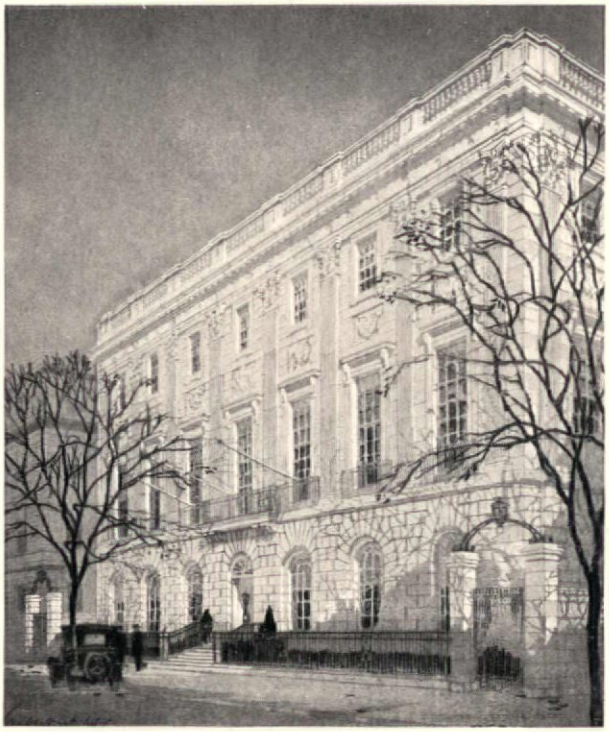
*A perspective drawing of the Insurance Company of North America Building, in lower Manhattan, now in course of construction. Shreve, Lamb & Harmon, architects*



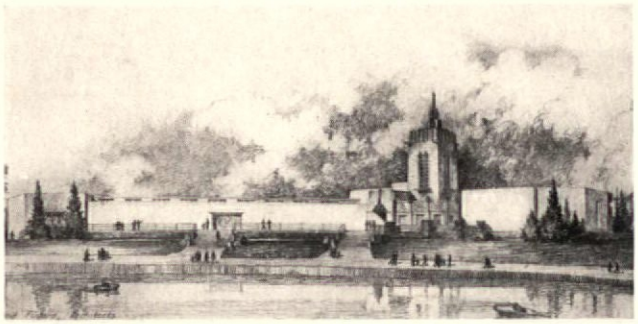



*Steel construction has been begun on the new Federal Reserve Bank Building, 10th and Chestnut Streets, Philadelphia, which will be an addition to the present structure. Paul P. Cret, architect*

# in Photographs



*A preliminary perspective of the United States Legation and Consular Building, Ottawa, Canada. Cass Gilbert, architect. The drawing was made by John T. Cronin*



*The Hall of Religion for the Century of Progress Exposition at Chicago, to contain exhibition space for various denominations. Thielbar & Fugard, architects*



*Above, the new home of the Worcester Art Museum, Worcester, Mass., William T. Aldrich, architect. Below at the left, is a view in the interior court of the same museum*






*Munger Hall, a new dormitory being built at Wellesley College, and to be run on a co-operative basis. William T. Aldrich, architect*

# BOOK REVIEWS

HARVARD CITY PLANNING STUDIES. IV. Urban Land Uses. Amounts of Land Used and Needed for Various Purposes by Typical American Cities. An Aid to Scientific Zoning Practice. By HARLAND BARTHOLOMEW. 174 pages, 7 by 9¾ inches. Illustrations from drawings. Cambridge, Mass.: 1932: Harvard University Press. $3.50.

Here is another and particularly timely volume in the Harvard City Planning Studies. Mr. Bartholomew has a real genius for probing into the facts and trends of city development, on which facts many national schemes of city planning, or even mere zoning, should be based. The book, indirectly, is a powerful argument for making a city plan based on facts first, and art afterwards.

ROME OF THE RENAISSANCE AND TODAY. By SIR RENNELL RODD. 304 pages, 6½ by 9¾ inches. Illustrated with drawings by HENRY RUSHBURY. Printed in Great Britain. New York: 1932: The Macmillan Co. $5.

Dealing in the main with Renaissance and post-Renaissance Rome, and more particularly with the rapid and drastic changes in the city during the last fifty years. Mr. Rushbury's drawings are well worthy of a place in the architect's office for themselves alone, even if they were not accompanied by Sir Rennell's authoritative text.

ENGINEERING: A Career—A Culture. A Message to Young Men, to Parents and Teachers. 61 pages, 6 by 9 inches. Illustrations from line drawings. Pamphlet binding. New York: 1932: The Engineering Foundation. 15 cents.

A pamphlet prepared by the Education Research Committee of the Engineering Foundation, outlining the professional functions of the engineer, his various spheres of action, his training, his obligations, and his rewards.

COLUMN CURVES AND STRESS-STRAIN DIAGRAMS. By WILLIAM R. OSGOOD. 12 pages, 6 by 9 inches. Illustrations from graphs. Research Paper No. 492. Pamphlet binding. Washington: 1932: U. S. Department of Commerce, Bureau of Standards. 5 cents.

THE VILLAGES OF ENGLAND. By A. K. WICKHAM. Foreword by M. R. JAMES. 52 pages, 6¼ by 9 inches. Illustrations from photographs and line drawings, with large geological map. Printed in Great Britain. New York: 1932: Charles Scribner's Sons. $3.75.

A companion volume to Basil Oliver's "The Cottages of England," and a well-rendered survey which divides England into "Chalk and Clay," the limestone belt, the western midlands, the southwest, and the north, with particular reference to the materials which the local builders used, and the types which arose therefrom. The illustrations ar numerous and beautiful.

CHURCH ARCHITECTURE: Building for a Living Faith. By FRANK BRANNACH. Preface by JOSEPH HUSSLEIN. 266 pages, 5¾ by 8½ inches. Illustrations from photographs and drawings. Milwaukee: 1932: The Bruce Publishing Co. $3.

The author writes for the priesthood and clergy particularly, as well as for the architect and layman, sketching the main outlines of ecclesiastical architecture in the past with emphasis upon the necessity of utilizing trained architects in our church building of the present day.

RECOMMENDED MINIMUM REQUIREMENTS FOR SMALL DWELLING CONSTRUCTION. Report of the Department of Commerce Building Code Committee. 107 pages, 6 by 9 inches. Illustrations from diagrams. Pamphlet binding. Washington: 1932: U. S. Department of Commerce, Bureau of Standards. 10 cents.

A revision of a report first issued in 1922, brought up to present-day practice.

THE CATHEDRAL OF PALMA DE MALLORCA. An Architectural Study. By RALPH ADAMS CRAM. 16 pages of text and 24 pages of plates, 9¾ by 12¾ inches. Illustrations from photographs and measured drawings. Cambridge, Mass.: 1932: The Mediæval Academy of America. $5; to members of the Academy, $4.

Doctor Cram laments the lack of authoritative material relating to this, "one of the most original and significant of Gothic cathedrals, as well as one of the largest." The measured drawings—one regrets that these could not have been reproduced at much larger scale—were made by Thomas T. Waterman, Thomas Phillips, and Charles Walsh.

HORIZONS. By NORMAN BEL GEDDES. 293 pages, 8 by 10¼ inches. Illustrations from photographs and drawings. Boston: 1932: Little, Brown & Company. $4.75.

Norman Bel Geddes is so facile in his means of presentation that the present reviewer, at least, is instantly put on the defensive. Whether the design is for an air liner, a bathroom scale, or an aerial restaurant, the presentation is always so immediately convincing that one feels an obligation to probe further into the skeleton and the intricate functioning of the creation. Unfortunately, too few of these creations of his have been executed. The refreshing stimulation of Bel Geddes's designs are largely due to his uncanny ability to view the problem objectively and with a lack of prejudice impossible in those more intimately concerned with its everyday study. The book, as its title indicates, is a look into the future over a foreground of varied achievement.




HOWE & CHURCH, ARCHITECTS

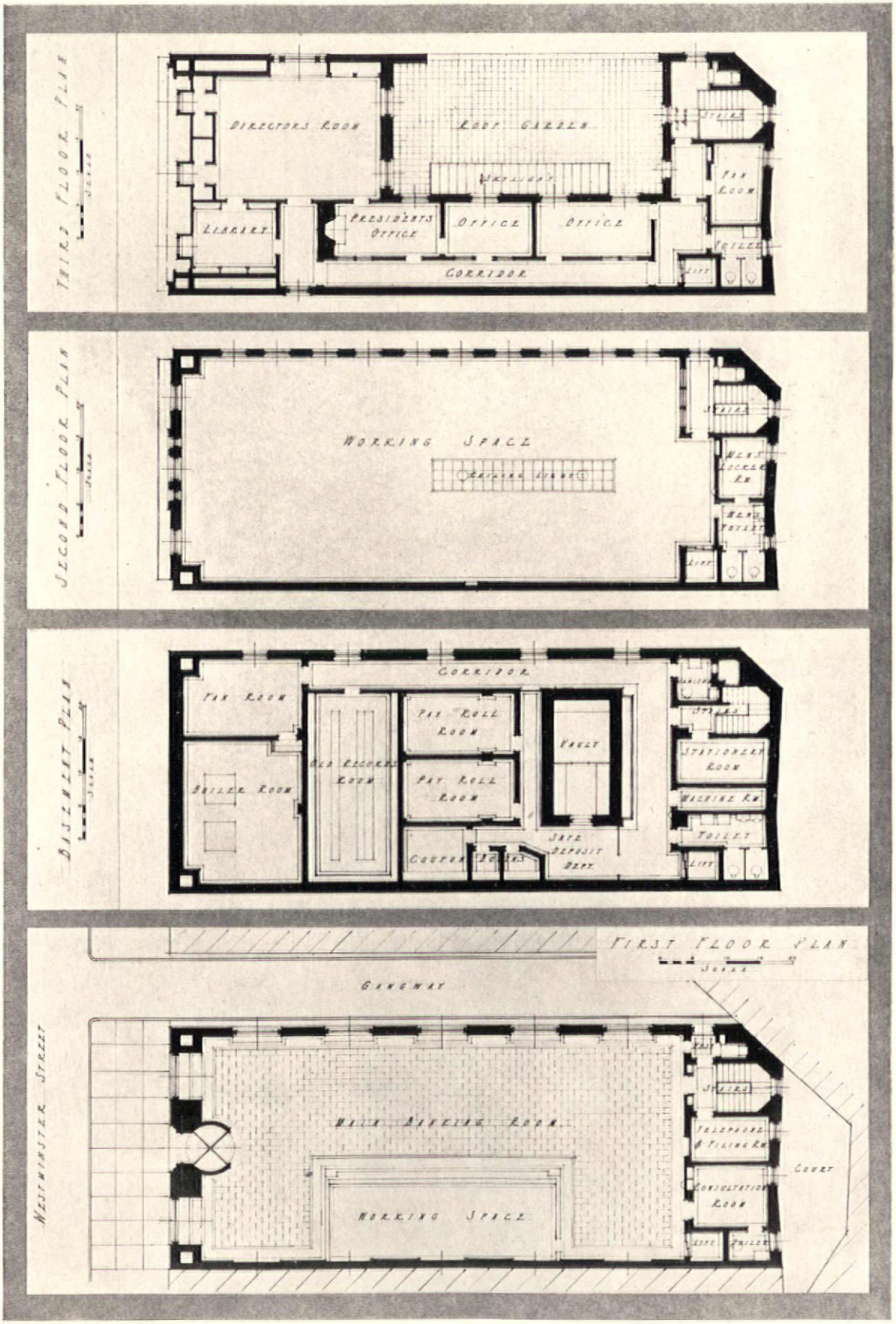
Providence National Bank, Providence, R. I.



*The exterior of the bank is of red brick with white marble trimmings, roof of black slate, and balcony of cast and wrought iron. On account of the narrow street on which the building stands, it is difficult to photograph; for that reason the exterior is shown by means of the architects' perspective.*

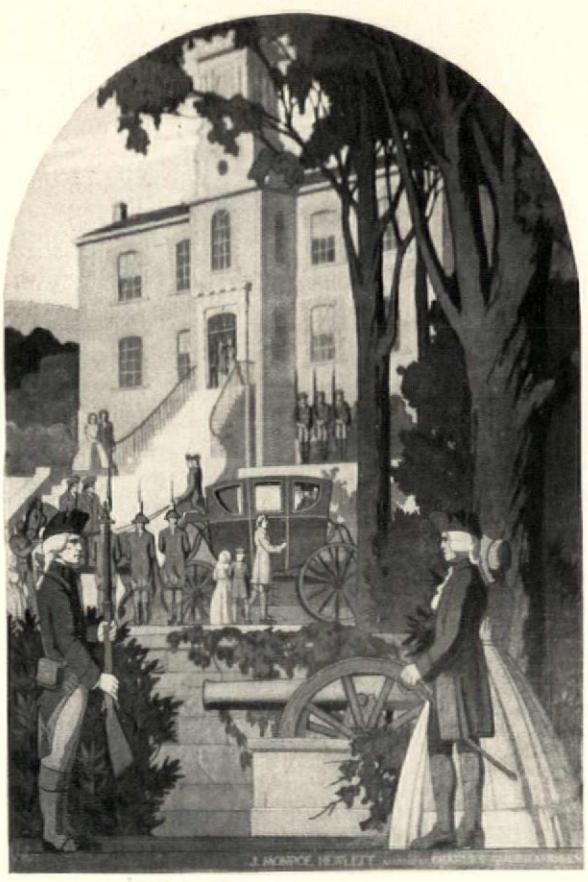
*In the banking room the floor is of marble, the woodwork of teak, and the metal railing on top of the low counter screen is of dull bronze*

*The murals in the main banking room, several panels of which are reproduced on page 160, represent the early industrial and commercial history of Providence. They are by James Monroe Hewlett, assisted by Charles Gulbrandson*




*Plans of the first floor, basement, second floor, and third floor*

PROVIDENCE NATIONAL BANK, PROVIDENCE, R. I. HOWE & CHURCH, ARCHITECTS





*Murals in the main banking room, Providence National Bank, Providence, R. I., painted by James Monroe Hewlett, assisted by Charles Gulbrandson*





# The Editor's Diary



*Monday, January 2.*—The papers are out with a scheme for an elevated highway around Manhattan, backed by all the weight of such names as those of Magonigle, Cross, Tilton, Kahn, Levi, Waid, and others, which really should be sufficient guarantee to make one cheer for the scheme without further examination. And yet I cannot help feel that this scheme, good as it is, completely ruins Battery Park, which, even under the present régime of neglect, is a feature of Manhattan that seems worthy of preservation. I should think the elevated highway might cross the lower end of the island a little farther up-town, say near Canal Street, leaving the old Battery undisturbed. We have a habit, it seems, of reviling those who built elevated roads in the past generation, tearing them down whenever it is possible—and then conceiving new and more elaborate elevated roads for this generation to build.

*Wednesday, January 4.*—Robert D. Kohn tacks a picturesque title to the new steel houses resulting from large-scale production, "zipper houses." He points out, as others have done, that the hope for better housing does not lie solely, nor even in large part, in decreasing costs of production. Some of the houses which have sold in the southern section of Brooklyn for about $5,200 actually cost in work and material $1,900, though the profit on these houses was not inordinate. The difference was swallowed up by other elements, by carrying charges, streets, financing, and so forth.

*Friday, January 6.*—Evidence is accumulating to bear out the contention of many leaders that we have been piling up a real shortage of housing space. Just as during the war we dammed up a reservoir of housing needs which burst upon us afterwards, so now we have built up another reservoir of large proportions. Here are the approximate totals of building in round billions, showing what has been happening. 1925, 6½; 1926, 6½; 1927, 6¾; 1928, 7¼; 1929, 6¼; 1930, 5; 1931, 3½; 1932, 1½.

*Saturday, January 7.*—Apparently President Hoover's rearrangement of Federal bureaus may fail of acceptance. Nevertheless, some such scheme as he has proposed for a division of public works seems logical, if not inevitable. This means that a division of public works would bring together the work now done in the Office of the Supervising Architect of the Treasury Department; of work on rivers and harbors heretofore directed by the Army Engineering Corps; and public roads, at present carried out by a bureau of the Department of Agriculture. With the consolidation of the government's building activities there would be still greater opportunity of utilizing public building as a balance wheel in our national economic progress.

*Monday, January 9.*—Lucian E. Smith, one of those architects who, having at the moment nothing in particular strong enough to hold him here last summer, took a car with him abroad for the purpose of adding to his knowledge of Europe, and particularly of rural England. He came in today, and is most enthusiastic about Liverpool Cathedral, having spent a whole month in its otherwise rather drab city, seeing the Cathedral at all hours and in all lights. His enthusiasm was mainly for the interior, which to him is second only to Chartres in its spiritual uplift. I was rather surprised to learn that the stone of which Liverpool Cathedral is built is a decided pink, which weathers to a brownish gray.

*Wednesday, January 11.*—The New York Chapter, American Society of Landscape Architects, is trying to move the national wheel off its dead centre by offering:

"To every property owner who will give men, now unemployed, work on his property at the rate paid by the local unemployment bureau, to the amount which would pay ten, or more, men for six days, a member of this Chapter will give a visit of consultation or supervision for the direction of the men's work without charge, except for necessary travelling expenses, and will give an additional visit for every similar amount so expended."

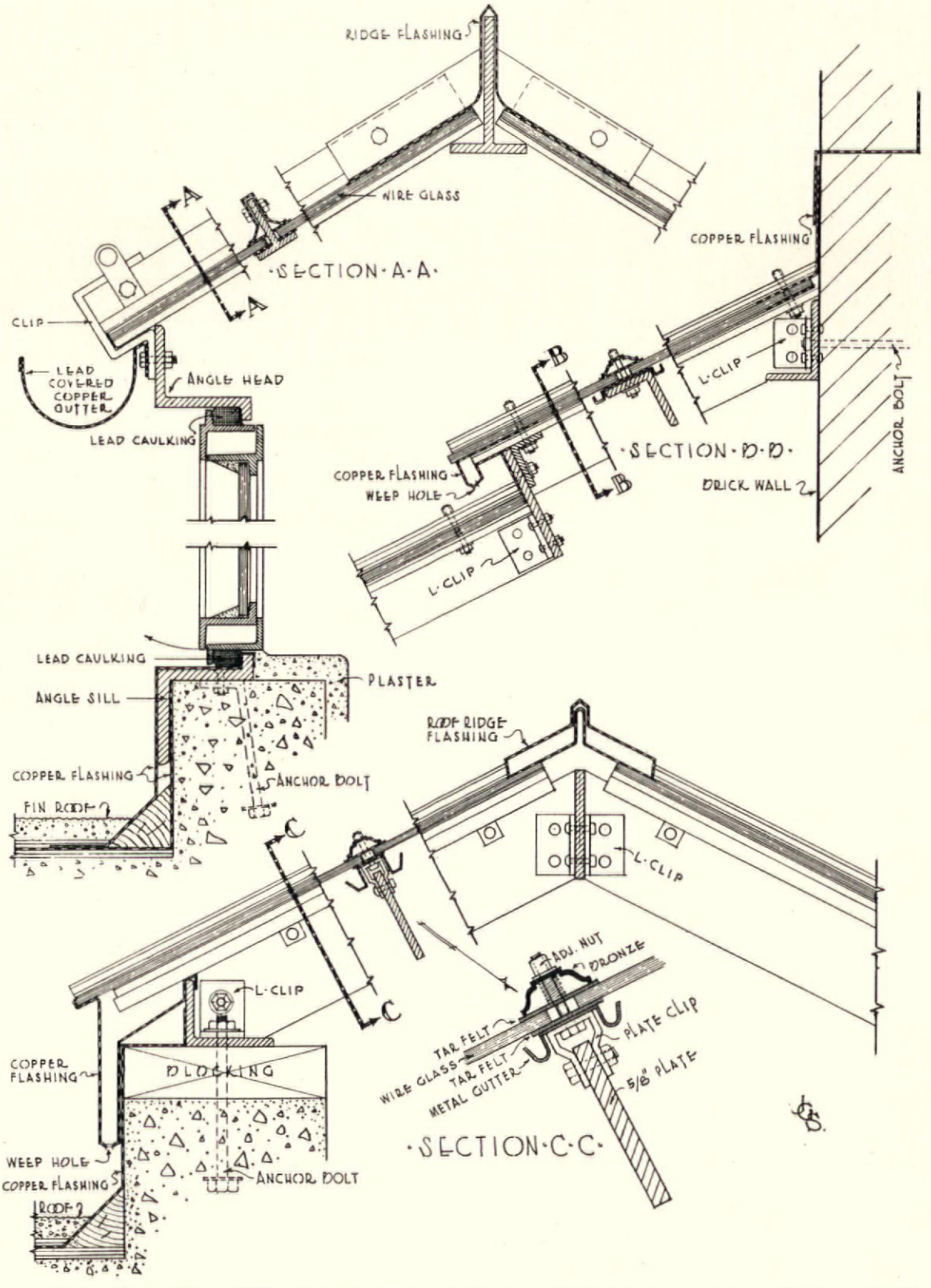


*Thursday, January 12.*—W. Duncan Lee up from Richmond, Va., telling me of the joy he had had in working for the past three years on the rebuilding of Carters Grove. The unending series of revelations, coming almost daily, concerning the origins, the idiosyncrasies of workmen, the unusual uses of materials, in connection with this James River mansion, built early in the eighteenth century, must be one of the most pleasurable experiences that can come into an architect's practice. The interior woodwork of Carters Grove is thought by many to be the best in Virginia, and the problem of maintaining it undamaged when subjected for the first time in its history to artificial heat, was one of the major problems. Carters Grove, until the present renaissance, never could have been really warm and dry inside of its thick brick walls. Mr. Lee hopes to avoid shrinkage and cracking of the great pine panels through unusual care in insulation, in concealing amply protected radiators, and, perhaps what is best of all, by maintaining the temperature for a year or more at not over sixty-five degrees—a price the owners are quite willing to pay. Incidentally, Mr. Lee succeeded in equipping the old house with seven bathrooms and a complete heating plant, without removing any of the panelling. Once removed from its original supports, panelling is rarely, if ever, returned intact.

*Friday, January 13.*—Harry F. Cunningham, professor of architecture, University of Nebraska, is going to conduct a small and select group of young architects, artists, and other human beings about Europe next summer. The party sails from New York on June 17, going to Liverpool first, to Chester, to Oxford, to London, to Winchester, and across the Channel from Southampton. At Le Havre they take a big bus and circle around part of France, including five days in Paris under the additional guidance of some of the local architects, who will show them all the new sights—and perhaps some of the old ones. Thence the party has a five-days' rest and conference at Oetz in the Austrian Tyrol, passes on down the Rhine, crosses Belgium and sails back from Antwerp. Gene Robb, of 55 West 42d Street, is managing the business end, and the cost is $400, all of which is almost as good as reading next year's seed catalogue.

*Saturday, January 14.*—Here's a crusade I'd like to join. Ely Jacques Kahn is chairman of a committee just organized to awaken the public to a need for better ventilation in railway and subway trains, street cars, buses, taxicabs, and private automobiles. Personally I think if they succeed in improving conditions only in the first two, the crusaders will deserve the thanks of most of the present population and of that to come.

*Monday, January 16.*—The 1930 census picked up a lot of information, some of which is interesting, some not so much




# · VARIOUS · SKYLIGHT · CONSTRUCTION · DETAILS ·

## A Series of Working Drawings by Jack G. Stewart

· SCALE : 0 1" 2" 3" 4" 5" 6". · PLATE · No. 34 ·

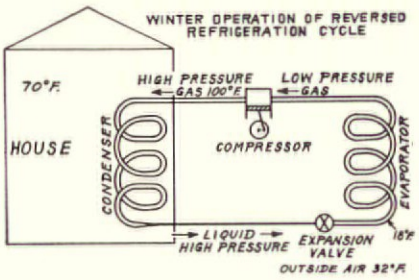
so—as for example, how many families have radios. The figures on rents and on values of owned homes are significant. Of the 10,503,386 owned non-farm homes in the United States, the median value is $4,778—18.1% valued under $2,000; 33.4% between $2,000 and $5,000; 31.3% between $5,000 and $10,000; and 15.2% $10,000 or over. There are more rented non-farm homes than those owned—12,351,549, for which the median rent is $27.15. These figures vary widely for the State, the median rent in three Southern States being under $10, while in New York it is $41.94. In spite of the inroads made in recent years by the apartment-house, 76.4% of all American families still live in one-family dwellings. Here is an interesting comparison—the percentages of home ownership, classified by color and nativity, are as follows: for all families, 46.8%; for native whites of native parentage, 48%; foreign and mixed parentage, 51.6%; foreign born, 51.8%; and Negroes, 23.9%. Homes having telephones run from 84.2% in Iowa to 3.8% in Louisiana.

*Tuesday, January 17.*—I had the pleasure of seeing today Thomas H. Benton's murals in one of the upper rooms in the Whitney Museum of American Art. It really does not seem proper to call these murals—to my mind a mural is a quiet, unassuming background that is rather flat in color and not at all insistent upon the story, if any, it has to tell. Benton's paintings, called "The Art of Life in America" do not fit this definition of a mural. He has a lot to say, and says it boldly and convincingly. The paintings are called, "Murals for a Reading Room." I doubt whether anyone could read in that room—the paintings are far more vociferous in demanding attention than any reading matter could possibly be. One who goes into the Whitney reading room will do well to leave all printed matter behind. Another traditional characteristic of the accepted mural type is scale, and here again Benton has jumped to a scale that makes the room itself seem puny and inadequate. The paintings, if they have the strength of appeal for others that they had for me, will eventually demand another room, an adequate room.

*Wednesday, January 18.*—Edwin B. Morris, Editor of *The Federal Architect*, paid us a luncheon visit at The Architectural League today. Even living in the midst of the steadily growing mass of government buildings in the Capital, and thereby being able to absorb their bulk and magnificence gradually as they are being built, he seems to be uncertain as to the ultimate result. Once more I find myself asking whether we are building another Rome in Washington, a Rome which by reason of its vast areas and overwhelming piles is going to be depressing rather than inspiring.

*Friday, January 20.*—Thomas T. Waterman, joint author with the late John A. Barrows of "Domestic Colonial Architecture of Tidewater Virginia," dropped in today on the first lap of a trip abroad which will take him to Spain, and finally to dwell indefinitely in Malaga. The island of Majorca seems to have attracted so many artists and architects as a solution of the present problem of living that it is, I hear, becoming overcrowded. The American bar and the contract bridge parties may ruin it in a very short time. Waterman thinks that Malaga, on the other hand, is as yet unspoiled.

*Monday, January 23.*—The Westinghouse engineers are working on an interesting phase of combined heating and cooling. W. C. Goodwin is directing the research, which has not yet reached a stage where it may be commercially employed. The scheme is shown graphically in the accompanying diagram.




Vapor from the outside evaporator is compressed, thereby raising its temperature. Flowing through the condenser indoors, the gas becomes a liquid, radiating heat. Reaching the expansion valve in the circuit, pressure of the liquid refrigerant is so reduced that it boils, and, in vaporizing, makes the evaporator cooler than the outside air. Heat, therefore flows from the outside air to the refrigerant, and the vapor is again drawn off by the compressor to complete the cycle. The scheme, while seemingly a paradox in that heat is brought indoors from a cool air, seems to be theoretically sound. Since the heat is not generated, but merely transferred from outside to inside the house, there is a high degree of efficiency obtained. The electric current consumed in pumping produces three to five times as much heat indoors as if the same electricity were directly converted into heat. Of course, this system, if sufficiently developed, serves for both winter heating and summer cooling, since the process described above is no more nor less than reversed refrigeration. In the summer the equipment would absorb heat from inside the house, pump it to the outside, and discard it.

*Tuesday, January 24.*—A. Lawrence Kocher and Albert Frey have gathered together some material for exhibition at The New School for Social Research. The thesis presented is that architecture, both in America and abroad, is in a transition period, to which we will all agree. The material shown in the exhibition compares very instructively an over-decorated theatre interior, for instance, with a clean functional one. The two make the obvious point that it is foolish to overload with ornament surfaces that, if not altogether out of the range of vision, are certainly not the focal point for which the interior was constructed. The comparisons, of which this is but a sample, are convincing, but when further exhibitions fall almost exclusively into the purely functional type of thing—box-like structures of glass and metal—it seems to me that in striving to be functional they lose at least one of the essentials of building, which is beauty. As has been said, it is not enough for a building to satisfy the demands of shelter, light, air-conditioning, acoustics, circulation, sanitation, and the like; it must also satisfy man's demand that he be given a pleasing environment. There are other ways of making this environment pleasing than by overloading most of the structure with meaningless decoration, of course, such as we did a generation ago, but in his present state of development I think it is not achieving a pleasant environment if we merely place man in a box of steel and glass and let it go at that. Architecture is not living up to its name if it is merely a machine in which to live.

*Wednesday, January 25.*—Dropped in at the Museum of Modern Art to see a chronologically arranged exhibition of Chicago's contribution to modern architecture as developed by Major Jenney, Richardson, Sullivan and his school, Burnham and Root, Holabird and Roche during the period 1870–1910. I think this is the first time that so complete a presentation has been made with the actual photographic evidences of buildings that have long been forgotten, if not entirely overlooked. The story of the illustrations is a graphic history of the displacement of self-supporting masonry walls by the steel skeleton frame and its curtains, a story of such historic significance in architectural history as to deserve being put into a comparatively permanent record between book covers.

Incidentally, Whistler's portrait of his mother is still here, loaned by the Louvre. It is going, I believe, to San Francisco, Toledo, and, for this coming summer, to the Art Institute of Chicago, where it may be seen by visitors to the Fair before it goes back to the Louvre in the fall.





*By gilding the principal lead lines of this stained-glass window, the D'Ascenzo Studios and Zantzinger, Borie & Medary sought to emphasize the structural quality of the design, and create an effective decoration, both in transmitted and reflected light. The window is in the chancel of St. Paul's Church, Chestnut Hill, Pa.*

# Stained Glass for Night and Day

# Some Pitfalls in Supervision

## *By W. F. Bartels*

XXIX. ROOFING AND SHEET METAL

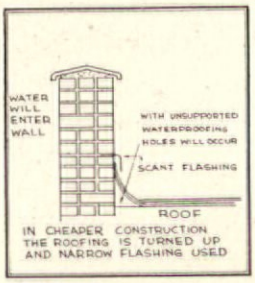
*(CONTINUED)*

METAL roofs may be tin, iron, lead, or copper. The superintendent must check the materials to see that they comply with the specification as to weight and gauge. Specifications for tin or iron often call for painting on the underside, while copper and lead do not. When laid on the roof the sheets, of course, should have a good bearing, so that any subsequent walking on the roof will not bend or injure the metal. If a copper-bearing iron or steel is used, it should bear the stamp of the manufacturer and also one showing the amount of copper contained. Tin sheets should be uniformly coated with tin. Copper, of course, should be the soft variety, leaving the hard copper only for leaders, gutters, etc. The soft sort will suffer much less "fatigue" due to expansion or contraction. Seams that conform to a good specification and conscientious supervision will result in a watertight roof.

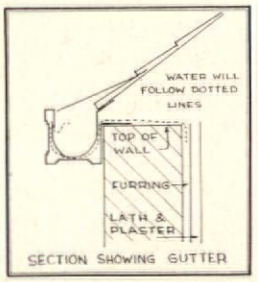
In addition to wood shingles there now are those of metal, asbestos, and various compositions. All of these must be properly laid if they are to perform satisfactorily. Improperly done, the work will cause great distress. In shingling, nails should be used that will not be affected by the weather. And, it might well be added, care should be taken that there is no ground work provided for electrolysis by having copper nails in zinc flashing, nor zinc nails on copper roofing. Then too, copper nails should be distinguished from copper-clad nails, which are really only copper-plated. Zinc flashing should not be allowed to come in contact with a copper gutter or vice versa.

Slate roofs, while now little used in the cities, have not lost their picturesqueness, and are in demand for country and suburban homes. Slate roofs should be well flashed and the superintendent should see that the slates are properly nailed. They must not be left loose nor yet nailed so tightly so as to be squeezed, because this will cause the slate to split when the temperature rises. Obviously the nails must be long enough so that they penetrate the wood at least an inch. The nails should of course be of nonrustable material.

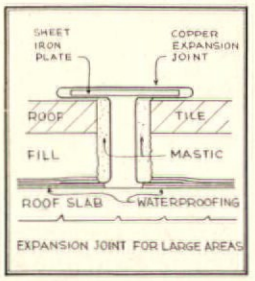
Composition roofs are generally laid on wood or cement foundations. In any case the surface should be cleaned thoroughly before the laying of the roof fabric is started. The superintendent should see that the first layers are securely nailed down in the case of a wood base. If the base is concrete it will be swabbed with pitch or tar, and into this will be rolled the first layer of felt. On top of this first layer will be added the others. The number of layers should be carefully checked against the specification, as well as the amount which each sheet should overlap. Successive layers should be well-rolled and brushed into the pitch. If the weather is cold there should be no lengthy expanse of pitch left to cool before the felt is rolled into it. The method generally used is to cut several lengths of felt, swab the pitch on the roof and then "walk" them down. This usually consists of one man taking two or three steps to make sure that the felt is stuck in as many places. Such a method does not insure the felt being in close contact at all points, particularly in cold weather. The argument is then advanced that "the heat from the other layers will penetrate the lower ones and cause the pitch to stick to the felt." The superintendent may convince himself of the folly of this practice if on a cold day he will pull up several layers after they have been laid down thus. However, by rolling the felt out and sweeping it down with a broom, a good job may be obtained. Any spongy roof should be condemned because the chances are all in favor of its eventually leaking. Sponginess is caused by small air-pockets and shows conclusively that the pitch is not binding the sheets of felt together. No felt should come in direct contact with another sheet of felt. If pulled up, individual layers should clearly demonstrate that pitch has been well spread between them. Where the felt turns up against the wall it is well to see that it fits snugly into the right-angle intersection, and does not form a curve against the wall with resultant air space, unless this space is filled with a solid puncture-proof material. Of course, if this curve is desired, blocking may be used to obtain it. Otherwise an unsupported roofing material cove will be a certain cause for leaks when some one walks too close to the wall.




*Watch the roofing behind the parapet*




*Look out for unsoldered gutters*




*A tile roof must have expansion joints*

If the roof is to be walked upon the top sheet should present a tough, wearable surface. If slag or gravel is used, a final thick layer of pitch is the usual prescription. If the roof is flat and tile is to be used, the superintendent must see that the proper number and kind of expansion joints are used. Expansion joints should be used around the entire edge of the roof, and of course no area greater than four hundred square feet, nor a distance longer than twenty-five feet, should be laid without a proper joint. After the tile has been laid this joint will be cleaned down to the pitch and a good grade of pitch or a stiff mastic used to fill the voids. These joints will take care of the usual roof size, but if a large area is covered it is better to make larger joints of metal as shown on the accompanying sketch. The superintendent should inspect the laying of the roof tile closely. He should have the day's work to end on a beam, or preferably on an expansion joint. If this is not done a noticeable crack will show up later where each day's work was stopped—and there will probably be a crack showing up along the beam line anyway.

A fill to which a topping is added is often put down for the tiles to be laid upon. The screeding of this topping must be checked to see that there is enough pitch and that it is in the proper direction so that the water will flow off properly. If cork or other similar material is used for insulation it must be laid smoothly and be all of uniform thickness. Failure in this respect will result in small pools forming on the roof after a rain. When the final check-up is made the roof should be looked over for puddles and for any other evidence that the roof does not drain properly. Such places can generally be discovered even several days after a rain, as the dirt and sediment is still visible even though the water has evaporated. Chipped or cracked tile should of course be removed and replaced with perfect ones.

Flashing is one of the most important items in a building and yet its entire execution is often left dependent upon the tinsmith's ability and integrity. True, this man may be experienced and know how to do his work thoroughly, but it seems a long chance for a superintendent to neglect this important supervision. Flashing may be zinc, galvanized iron, copper, lead, and, on the more expensive jobs, lead-coated copper. The latter has an added advantage of protection against the acids and gases prevalent in the atmosphere of large cities. Lead more nearly matches gray stone work, preserves its original color, and prevents copper salts from discoloring the stone work. Where the top of a sidewalk vault is flashed to a building, scrupulous attention must be given to the work. The flashing must be well attached to the waterproofing fabric, and the metal run through the wall and turned up on the inside of the wall at least three inches above the top of the finished sidewalk. In fact, turning it up five inches will do no harm. The tinsmith is prone to regard such a margin as a waste of money—to turn up flashing to that height when the water will more readily go under or over the saddle of a door if present, rather than flow uphill over a three-inch turnup. Also, when the flashing is being run, there is generally no finished sidewalk laid, by which the amount of flashing turnup may be judged. Hence, it is better to have the flashing an inch or two above the required height than to have it below the top of the sidewalk. Then too, it is much more satisfactory, if there is a leak, to know that you must look for it at a door opening, rather than to tear out many running feet of decorated walls before discovering its origin. It is always advisable to use a soft metal for flashing, since there is less danger of its breaking under the continuous bending due to expansion and contraction. If the superintendent is "on the job" and watches the details carefully there is no excuse for a leak at the saddle of any door. But if there is, it is a sign of poor workmanship, construction, or supervision—generally the first named. The sheets of flashing should be soldered to one another. After being turned up on the inside, care should be taken to see that they are not subsequently beaten down by accident.

(*To be continued*)





# HOUSE OF HERBERT ALLEN, JR. LOS ANGELES, CALIF.

ROLAND E. COATE,
ARCHITECT

*The profession as a whole continues to marvel at the restraint and the courage which moves the Southern California architects to produce asymmetrical façades that, on the drawing-board, must appear of questionable success, but which, in the final setting, so seldom fail of achieving beauty*



*To those who would say that planting, sunlight and shadow are responsible for half the success of Southern California architecture, we would reply that the architects have learned the foils for that wealth of sun and luxuriance: the unbroken wall area of stucco or painted brick, the proper overhang for tile-edge shadows, the drawing closely together of house and its garden so that the two become one*

*Below, a corner of the living room in the Allen house, bringing indoors some of the feeling for strong contrasts and broad, unbroken areas that mark the exterior*



THE SEVENTY-SEVENTH IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

# ARCHITECTURE'S PORTFOLIO OF METAL STAIR RAILINGS

*Subjects of previous portfolios are listed below at left and right of page*



1926
DORMER WINDOWS
SHUTTERS AND BLINDS

1927
ENGLISH PANELLING
GEORGIAN STAIRWAYS
STONE MASONRY TEXTURES
ENGLISH CHIMNEYS
FANLIGHTS AND OVERDOORS
TEXTURES OF BRICKWORK
IRON RAILINGS
DOOR HARDWARE
PALLADIAN MOTIVES
GABLE ENDS
COLONIAL TOP-RAILINGS
CIRCULAR AND OVAL WINDOWS

1928
BUILT-IN BOOKCASES
CHIMNEY TOPS
DOOR HOODS
BAY WINDOWS
CUPOLAS
GARDEN GATES
STAIR ENDS
BALCONIES
GARDEN WALLS
ARCADES
PLASTER CEILINGS
CORNICES OF WOOD

1929
DOORWAY LIGHTING
ENGLISH FIREPLACES
GATE-POST TOPS
GARDEN STEPS
RAIN LEADER HEADS
GARDEN POOLS
QUOINS
INTERIOR PAVING
BELT COURSES
KEYSTONES
AIDS TO FENESTRATION
BALUSTRADES

*Below are the subjects of forthcoming Portfolios*

Verandas
APRIL

The Eagle in Sculpture
MAY

Eaves Returns on Masonry Gables
JUNE

Exterior Lettering
JULY

Entrance Driveways
AUGUST

Corbels
SEPTEMBER

*Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up about six weeks in advance of publication date.*

1930
SPANDRELS
CHANCEL FURNITURE
BUSINESS BUILDING ENTRANCES
GARDEN SHELTERS
ELEVATOR DOORS
ENTRANCE PORCHES
PATIOS
TREILLAGE
FLAGPOLE HOLDERS
CASEMENT WINDOWS
FENCES OF WOOD
GOTHIC DOORWAYS

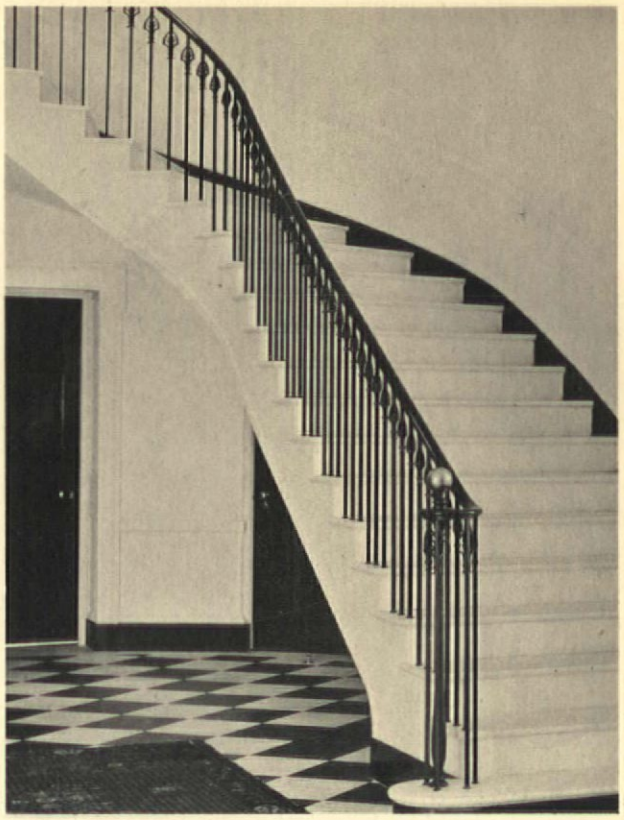
1931
BANKING-ROOM CHECK DESKS
SECOND-STORY PORCHES
TOWER CLOCKS
ALTARS
GARAGE DOORS
MAIL-CHUTE BOXES
WEATHER-VANES
BANK ENTRANCES
URNS
WINDOW GRILLES
CHINA CUPBOARDS
PARAPETS

1932
RADIATOR ENCLOSURES
INTERIOR CLOCKS
OUTSIDE STAIRWAYS
LEADED GLASS MEDALLIONS
EXTERIOR DOORS OF WOOD
METAL FENCES
HANGING SIGNS
WOOD CEILINGS
MARQUISES
WALL SHEATHING
FRENCH STONEWORK
OVER-MANTEL TREATMENTS

1933
BANK SCREENS
INTERIOR DOORS

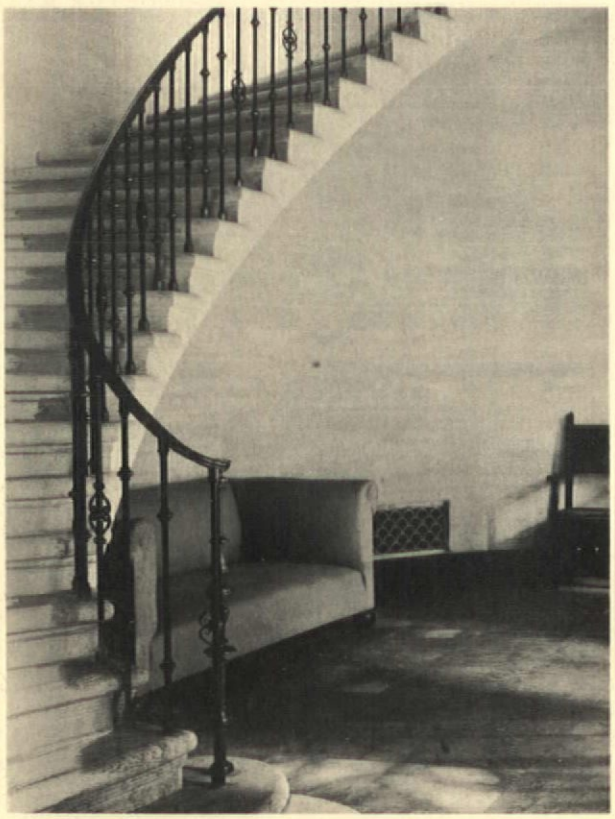


*Arthur Munson*



*Delano & Aldrich*

*Sterner & Wolfe*



*Moise Goldstein*





*Bradley Delehanty*



*Gable & Wyant*

*Pliny Rogers*

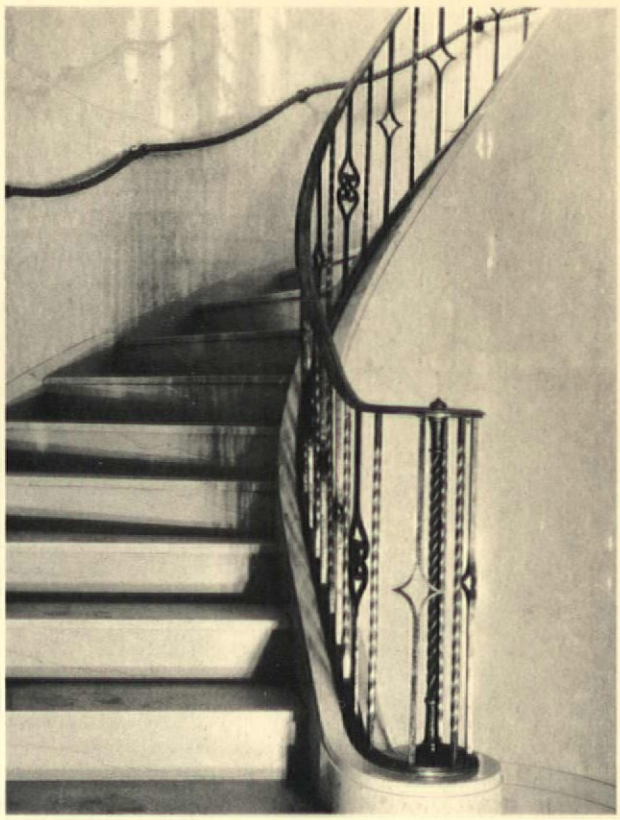


*Arthur Loomis Harmon*



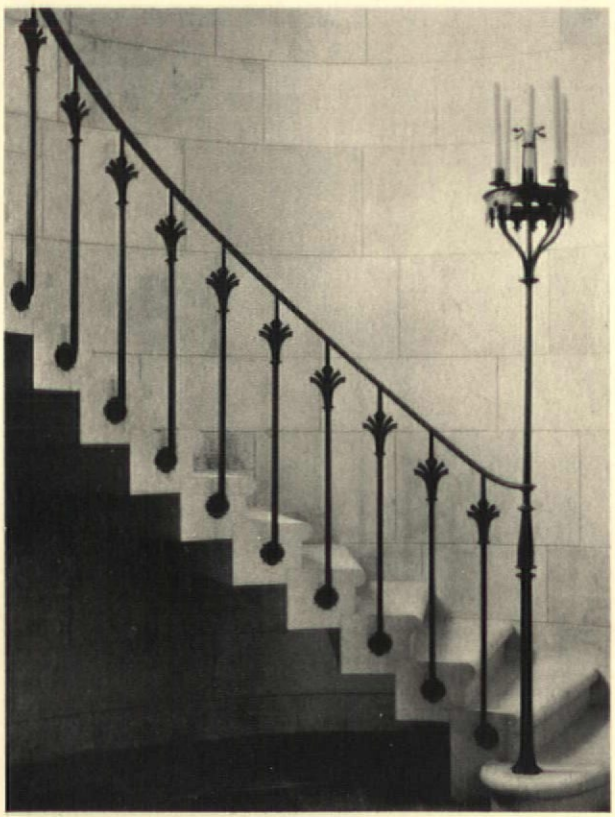


*Greville Rickard*



*Tilghman Moyer Company*

*Tilden, Register & Pepper*



*Roland E. Coate*





*William M. Ingemann*



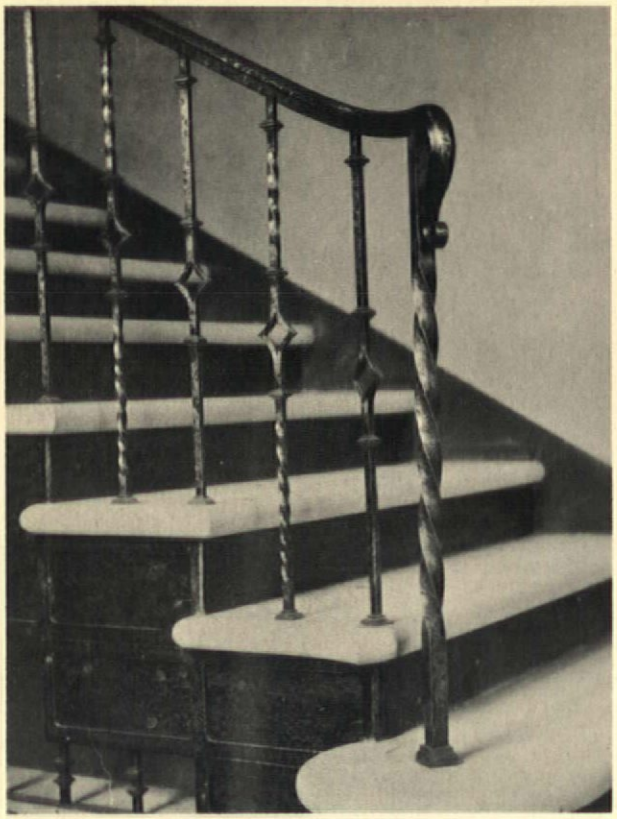
*Richard Arnold Fisher*

*In a Florentine palace*



*William M. Ingemann*



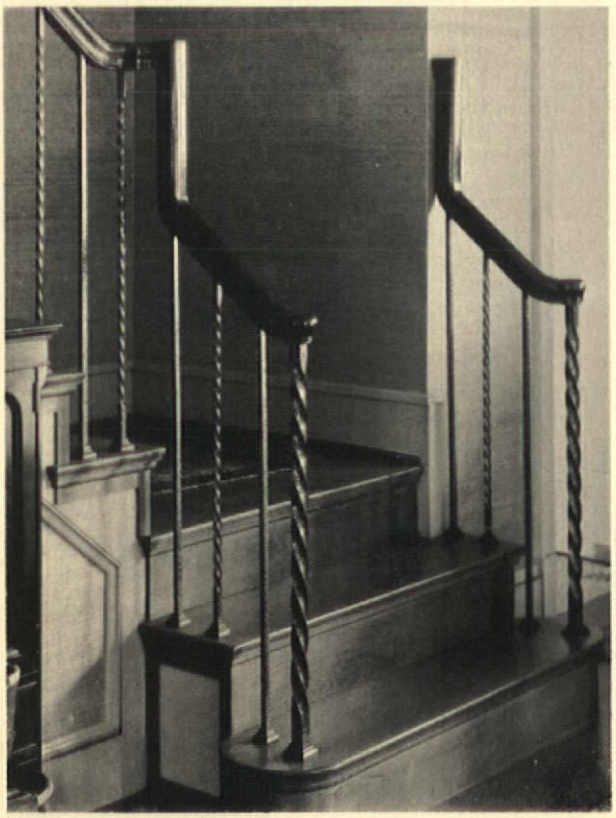


*Henry Powell Hopkins*



*Francis A. Nelson*

*Melvern R. Evans*



*Meade & Hamilton*





*Davis, Dunlap & Barney*



*Hugh L. Allward*

*Felix Burton*

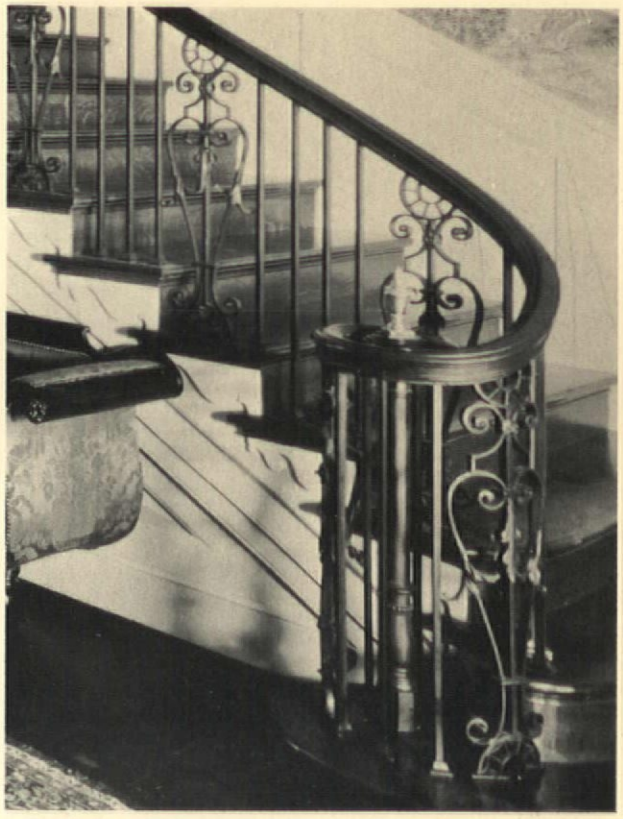


*Hentz, Adler & Shutze*





*Lucian E. Smith*



*F. G. Dempwolf*

*Carl A. Ziegler*



*Joseph H. Freedlander*





*Tilden, Register & Pepper*



*Marion Sims Wyeth*

*Greville Rickard*



*Roland E. Coate*





*Delano & Aldrich*



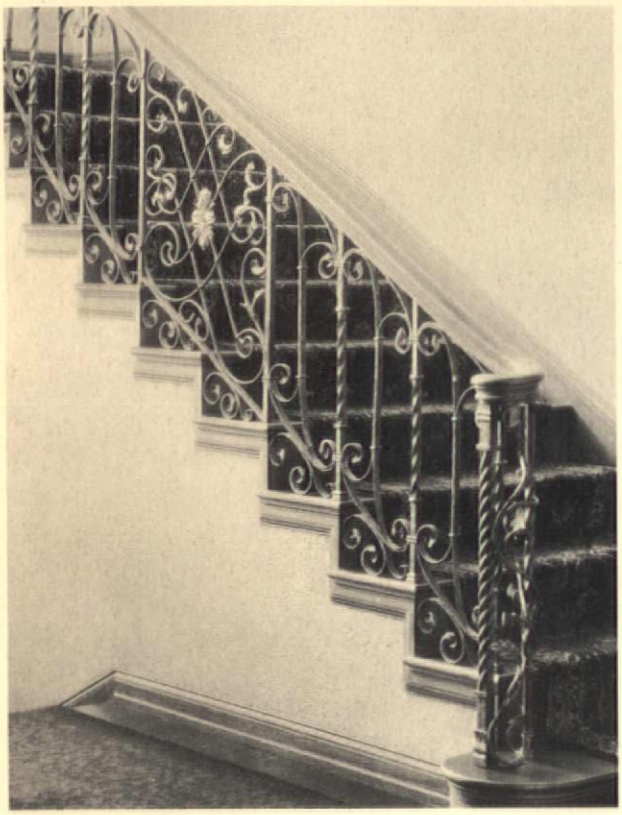
*Arthur Loomis Harmon*

*Morgan, Walls & Clements*

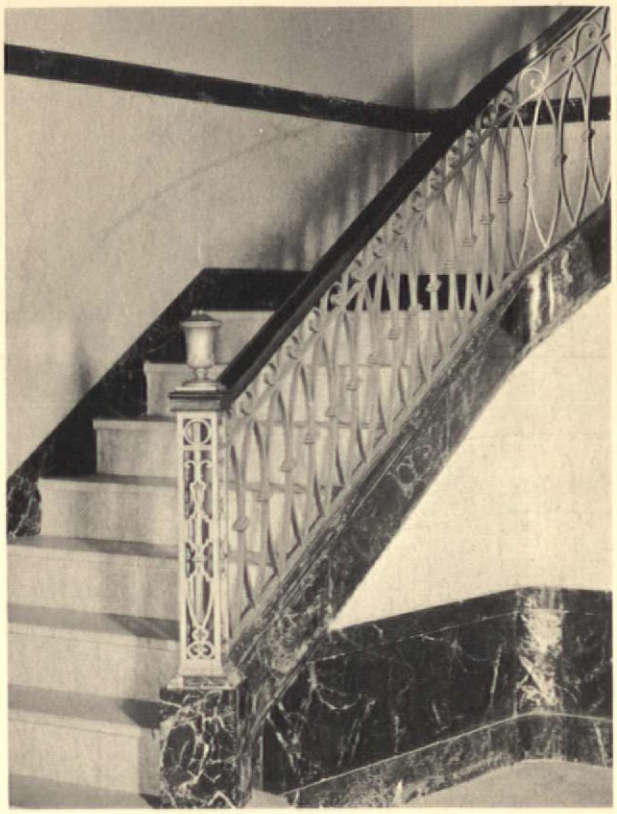


*G. Stanley Wilson*





*Meade & Hamilton*



*Fred Wesley Wentworth*

*Philip L. Goodwin*

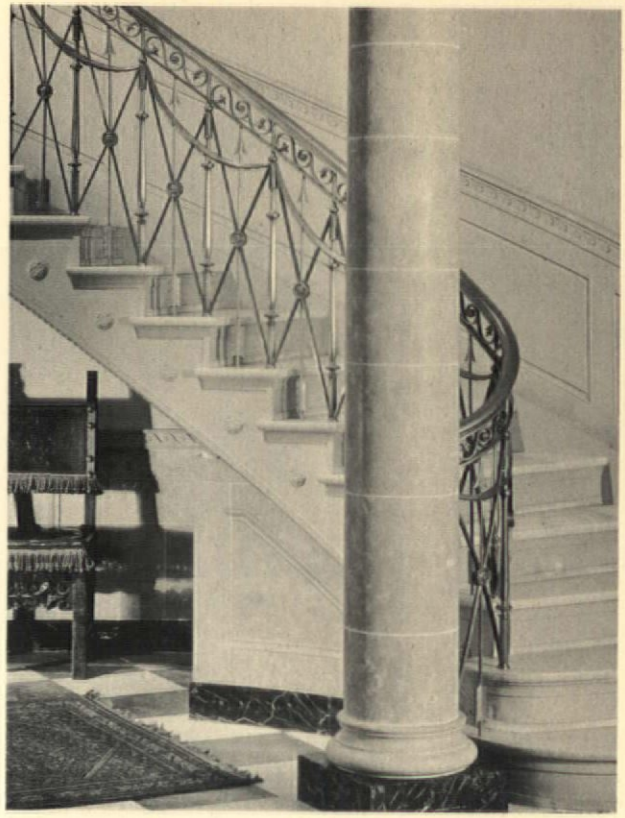


*The Office of John Russell Pope*





*Kilham, Hopkins & Greeley*



*Aymar Embury II*

*Schultze & Weaver*



*Schilling & Schilling*



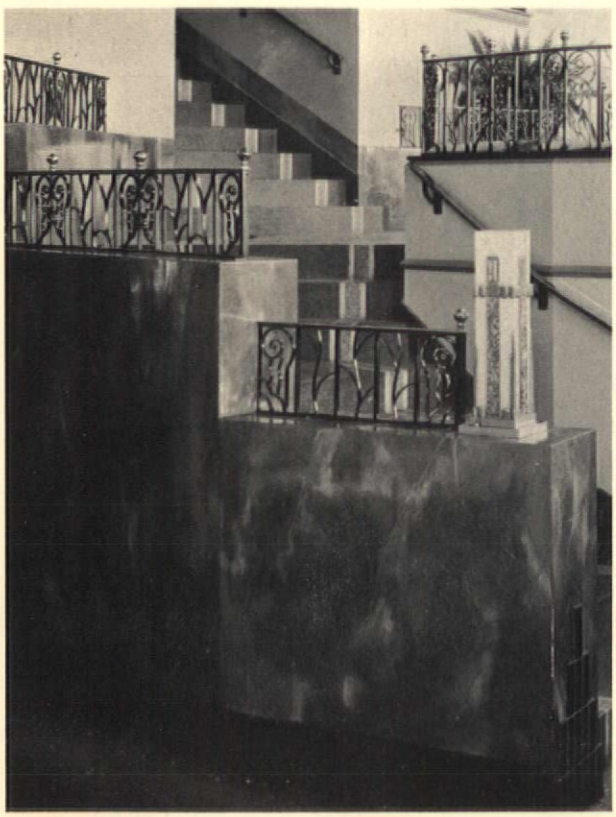


*Walter W. Ahlschlager, Inc.*



*Corbett, Harrison & MacMurray*

*Walter Hagedolm*

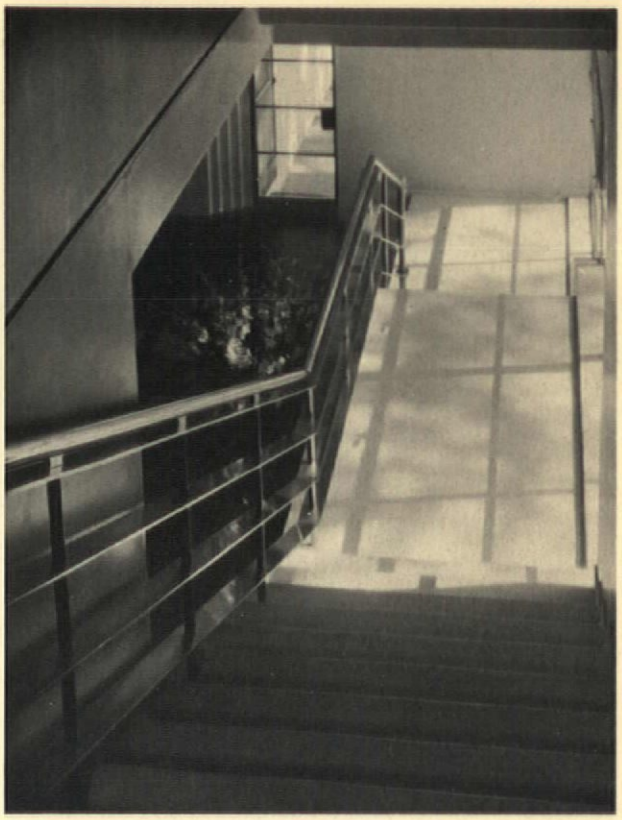


*Schultze & Weaver*



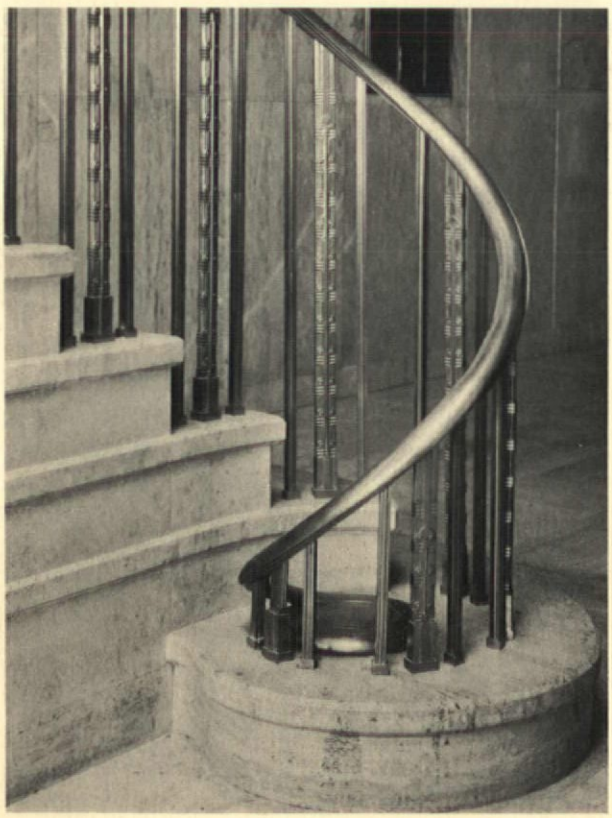


*Easton & Robertson*

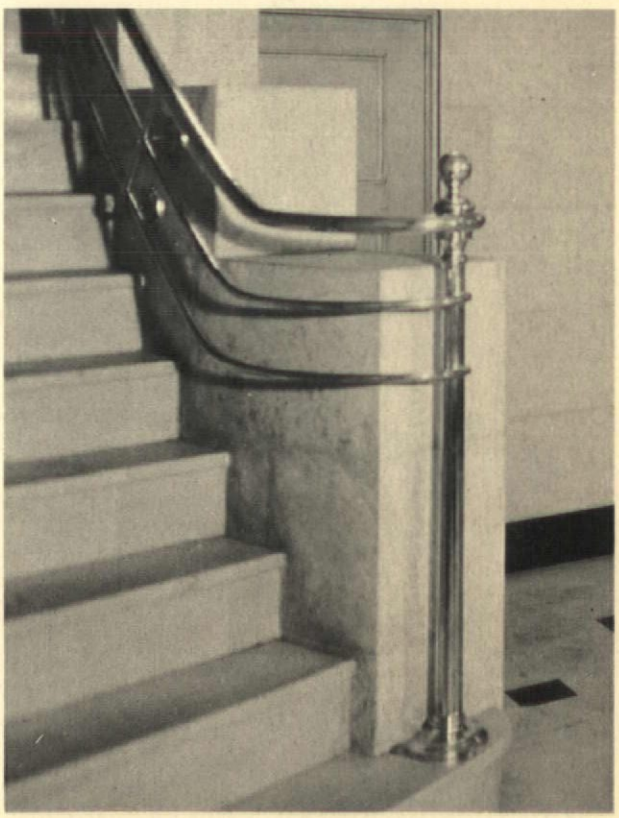


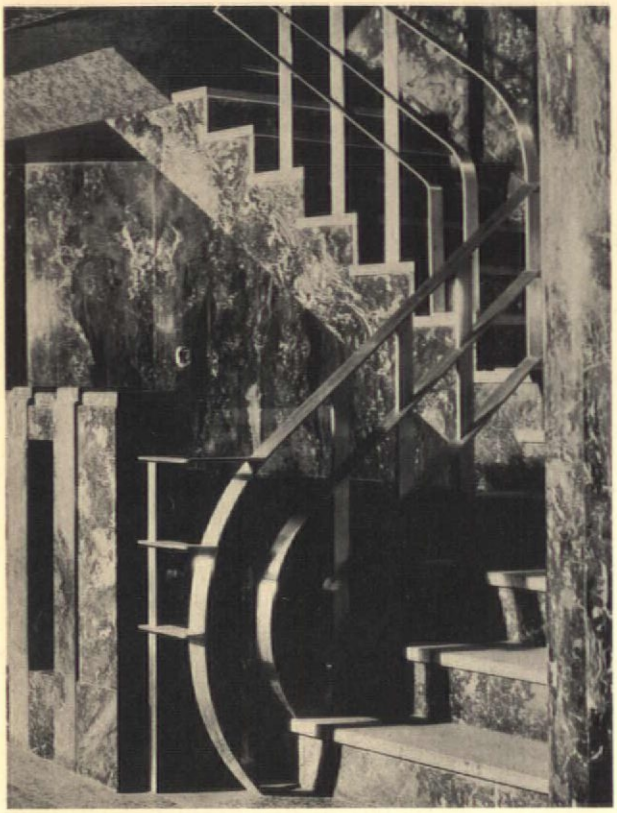
*Cedric Gibbons; Douglas Honnold*

*The Firm of Ely Jacques Kahn*



*Lundeen, Hooton, Roozen & Schaeffer*





*Alfred C. Finn*



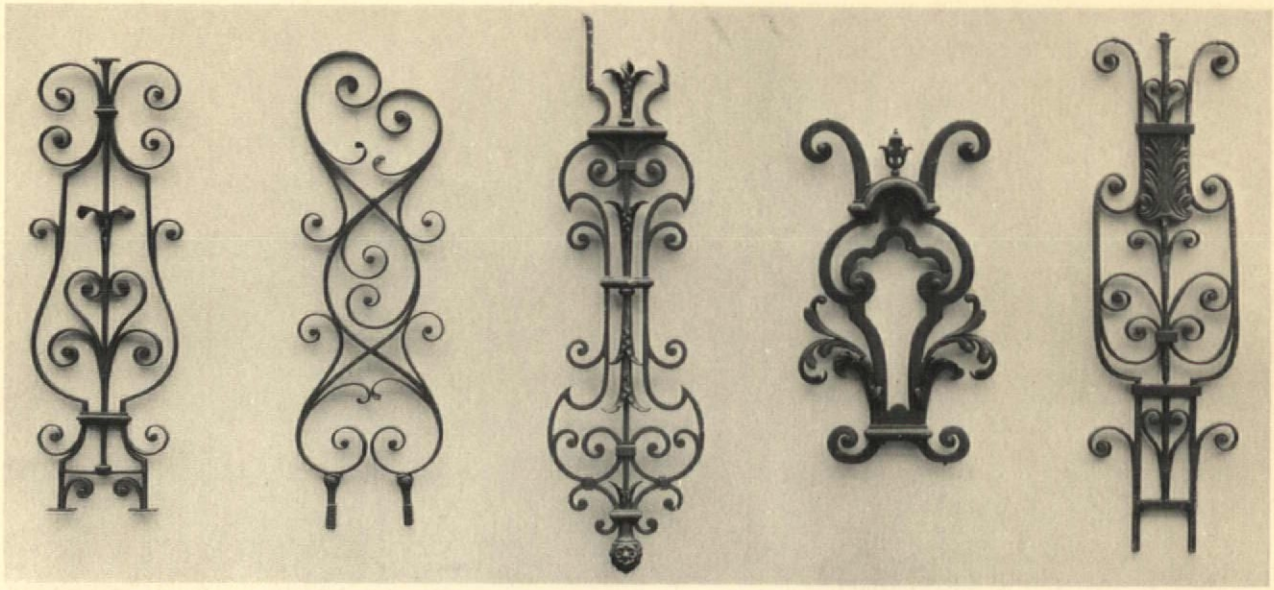
*DeYoung, Moscowitz & Rosenberg*

*John M. Howells; Raymond M. Hood*



*Albert Kahn, Inc.*





*Ironwork Balusters, English, Early Eighteenth Century*

*By courtesy of the Metropolitan Museum of Art*

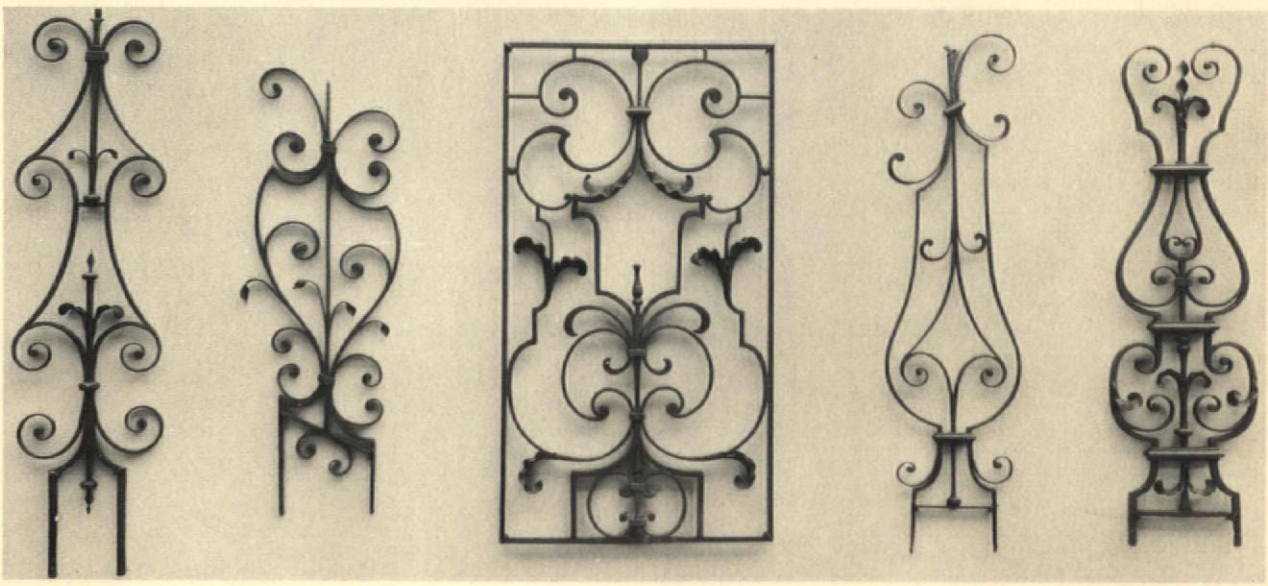
*Sir Edwin Lutyens*



© *Underwood & Underwood*

*Ironwork Balusters, English, Early Eighteenth Century*

*By courtesy of The Metropolitan Museum of Art*





ARCHITECTURE

VOLUME LXVII APRIL 1933 NUMBER 4

# The Renascence of Carter's Grove

## ON THE JAMES RIVER, VIRGINIA, NOW THE HOME OF MR. AND MRS. ARCHIBALD M. McCREA

*By W. Duncan Lee*

*Photographs by Robert W. Tebbs*

I STARTED to head this "The Restoration of Carter's Grove," but I feel that the word "restoration" has been stretched far out of shape and I don't want to start an argument right at the beginning. An old building can be and should be faithfully restored, and left at that, if it is to be used for museum purposes solely, but if a person buys an old house, pays a lot of money for it, and intends to use it as a year-round home, he is not going to be satisfied to take his bath in a tin foot-tub and go to bed with a candle in one hand and a warming-pan in the other just for archæological reasons.

So, the job has got to be a "restoration—plus," and the plus is a great big part, like the plus in those cost-plus contracts. What is there must be brought back to its original condition. What has been destroyed must be replaced in keeping, and the whole preserved for the future. This we may call "restoration." Where enlargements are absolutely necessary, a precedent of the period should be found and followed, and while this cannot be truthfully called a restoration as applying to this building, it is still a restoration of a condition of the time as shown by other examples.

Where the building is to be adapted to modern living conditions, much equipment must be installed for which no provision was made in the original structure, and this is where the "plus" comes in. In the first place, this whole establishment contained only four bedrooms. It's true there was a large up-stairs hall, bigger than any of the bedrooms, but you just can't sleep 'em all over the floor now as they did in old times. Then, too, there had to be room for some baths and closets without cutting up the original bedrooms. This wasn't so bad, though, for there was a space of twenty-five feet between the main house and the wings on each side; this had to be filled in anyhow, to bring the kitchen in touch with the dining-room and to make the office of use as part of the house.

This kind of a gap between the house and wings never existed in Maryland. The houses there, of the same period as Carter's Grove, were built in five units, and the idea began seeping into Virginia from the Maryland border toward the close of the eighteenth century, as evidenced in Woodlawn in 1799. If Burwell, of Carter's Grove, did not intend from the first to connect up his three units, it is very probable he would have done it eventually if he had not moved from here to Carter Hall about the time Woodlawn was built.

The Burwells started their building operations just at or before the beginning of the eighteenth century, with the erection of the building which later became the kitchen wing. Some years later, the owner stepped off one hundred and twenty-two feet due west and built another building exactly like the first, and it later became the office wing. From this we believe he knew at the time just what size building he would erect between the two as his main dwelling. We might be justified in going further and assuming that when he recovered from his third building operation, he would go on and connect the three units up, as has now been done, with a stretch to the whole of a little over two hundred feet from end to end.

Anyhow, filling those gaps helped to provide much additional space, but what was still needed was all those things which man has been



*The river front, which looks out upon the James under the protection of the two giant tulip poplars. The present additions to the old mansion are the connecting links between end buildings and the main house*

able to devise in the past two hundred years for his own comfort and satisfaction and which we now call "modern conveniences." To provide these with the minimum of disruption to the original work and still preserve the atmosphere of an eighteenth-century house was a real problem, and something which I think we have accomplished. Even more important than the additional room and modern conveniences, however, was to make certain of the structural safety of the building, to overcome two hundred years of deterioration, to safeguard against further ravages of time, and, as far as possible, to secure protection from fire; and all done with the least possible removal and no injury to the original. Of course, this could have readily been done by taking down all panelling, removing all plaster and taking up floors, but to do this where it could be avoided seemed a sacrilege. However carefully old panelling may be removed and replaced, in the doing something is lost that cannot be recaptured.

The problem here, then, became one of four parts: First, enlargement; second, structural restoration; third, period restoration; and, fourth, modern equipment. The owners and I visited the property several times before the purchase was made, and since the possibility of enlargement in keeping with the period was one of the conditions of purchase, this was fully discussed and agreed upon so that the first set of sketches, with minor changes, was ac-



*The little end building in the foreground—the kitchen wing—was the earliest of the group. Some years afterwards the other end building was built, directly in line with it, and finally the main house. Possibly Carter Burwell intended a group of three buildings, but just as probably he might have eventually linked them together*

cepted. Thus, the first part of the problem was practically settled. On the same visits, an attempt was made to determine what structural restoration was needed, but this, so far as the main house was concerned, was impossible, since no structural members were exposed except in the cellar. The office wing, on which no repairs had ever been made, and the kitchen, were in bad shape except for the walls. A connection between the main house and kitchen had been built some twenty years ago. This we did not like and decided to replace. The examination in the cellar of the main house showed all timbers so rotten from one to three inches on the bottom that they could be pinched off with the fingers, and a worse condition where these went into the wall was suspected. But the house was such an exceptional architectural example, so adaptable to the owners' requirements, and so ideally situated, that the purchase was decided on.

As to the period restoration part, the first visit to the place settled that. Even the terrible walnut and mahogany stains, high-gloss varnish, and china-white enamel could not hide the beauty of that panelling. The detail so closely followed the Georgian oak rooms of the time that I felt convinced that the builder, brought over from England to do the work, had carefully selected his wood and did not intend it to be painted or stained. The great temptation was to order, at once, carloads of varnish remover and dozens of painters and get down to the surface of that mellow old Virginia pine that we knew was there. But somebody remembered that the plumbers and steamfitters were yet to



*The dining-room, the woodwork of which is in old ivory—all the original panelling. When the present restoration was contemplated, the fireplace had been bricked up. For this interior and others shown in the following photographs the decorating was done by O. E. Mertz & Company*

come, and varnish was a good protection from greasy finger prints, so this had to wait; but eventually we were rewarded with a revelation of even greater beauty than we had suspected.

As to the fourth part of the problem, well, there was a fair-sized family and there would be plenty of guests, so there had to be baths and lots of them—not makeshifts, but real baths with all the trimmings. Heat everywhere, two-hundred-foot run of pipes and eight floor levels, and, to save that panelling, automatic control for every radiator. Electric lights of course, 'phones most everywhere, electric refrigerators, electric cooking, insulation, etc., etc. It began to look as if we had bought four walls, a roof, and some lovely panelling, and somewhere under and between these we had to hide a lot of things that Burwell got along without and never missed.

In three years of slow and painstaking work, it was done, and there are eleven bedrooms, seven baths, ten other rooms, a subcellar heating plant and a super-attic storage space. The equipment is as complete and the house, I believe, is as structurally sound as if it had been built entirely new. No panelling was removed from the walls for the purpose and only a few floor boards taken up, but every pipe, radiator, wire, and even electric switch, is completely hidden. Except for the thermostats

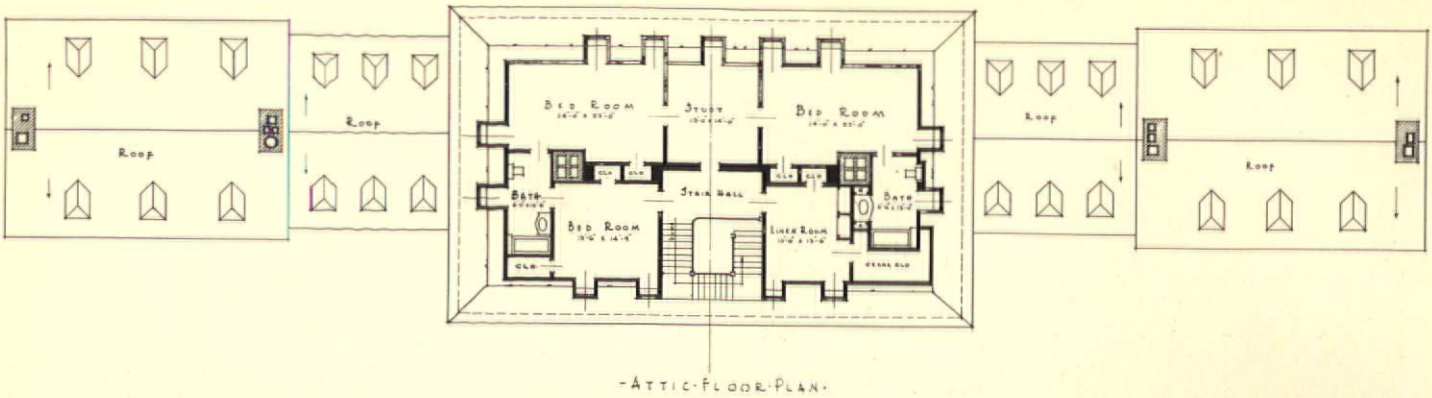


*This is the New Room, added by W. Duncan Lee to join the main house to the old office building, the interior of which may be seen through the doorway at the left. Here, too, the woodwork is old ivory*

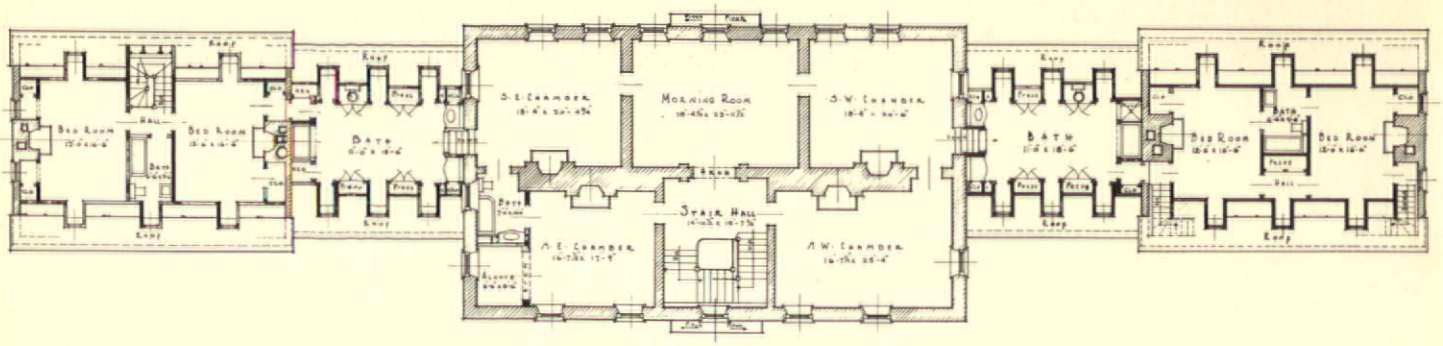
and electric bulbs in the fixtures, there is nothing in evidence that was not there in the early part of the eighteenth century.

The purchase of the property was made just before Christmas, 1927. Survey and plans of existing buildings were started January 2, 1928, and sketches were completed and approved January 27. Working plans were completed February 28, 1928. Before plans were completed, arrangements had been made with a builder, himself an expert mechanic and craftsman, to take charge of the work at the site on a salary basis. Work was started March 1, with a small picked force which was increased as required. All carpentry, painting, and miscellaneous work was done by selected men, all payrolls and bills for material being approved by the foreman, superintendent, and architect, and then paid by the owner. Separate specifications were prepared for each trade, and bids were taken and contracts awarded as their work was needed. This method avoided many changes and consequent extras after contracts were awarded. No sub-contractors were allowed to do any cutting into old work.

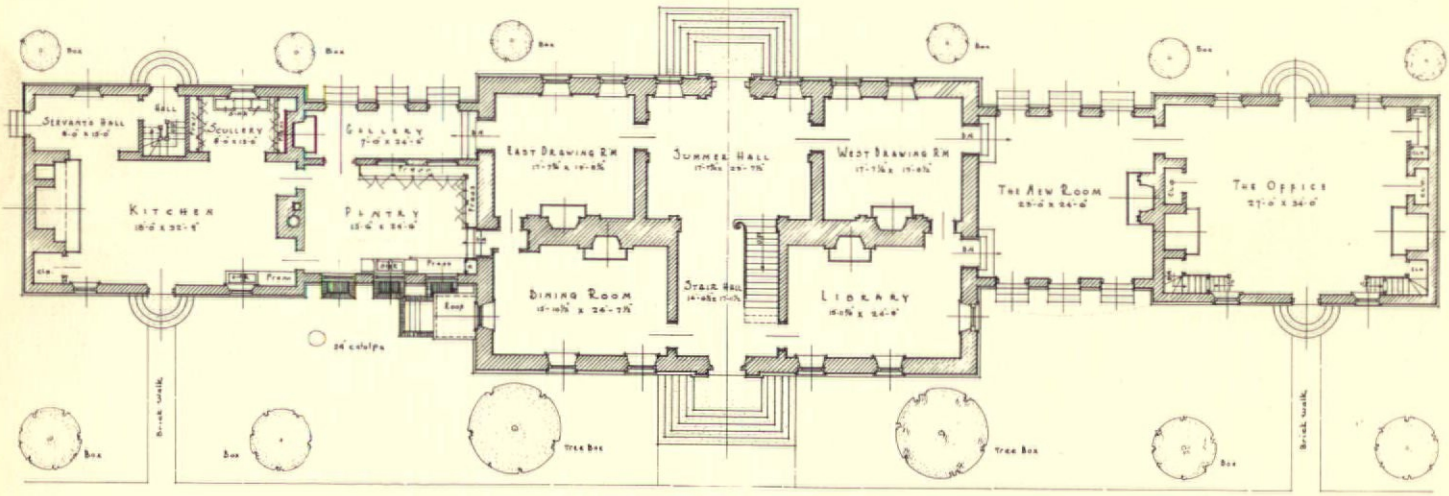
On completion of the three years' work, it was found that the entire amount paid out for overhead, profit, and administration on construction work was a fraction less than five per cent of the cost of the work.



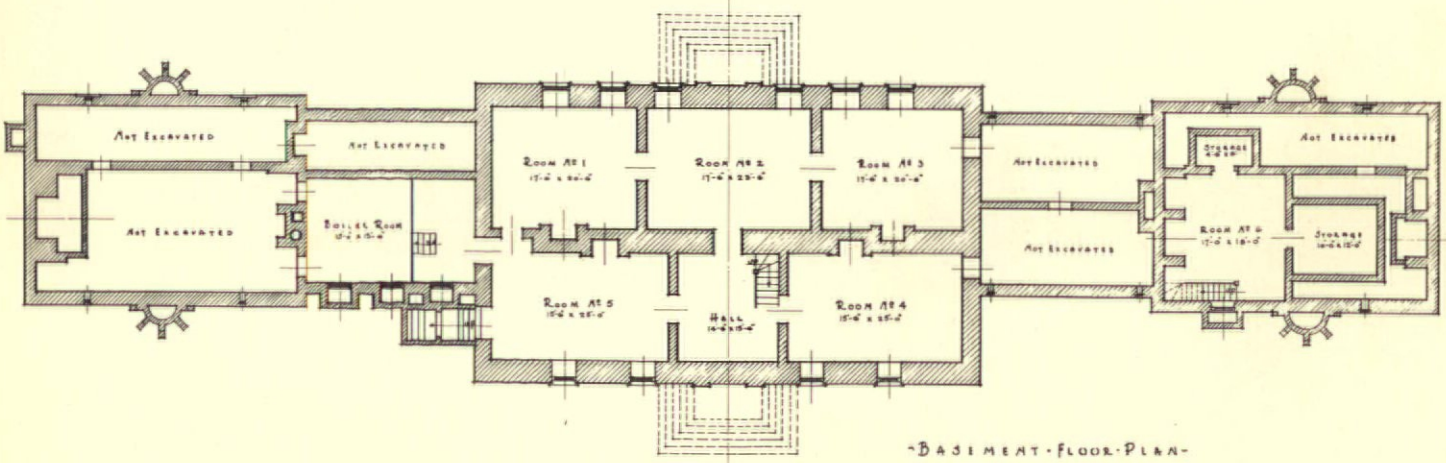

-Attic Floor Plan-




-Second Floor Plan-

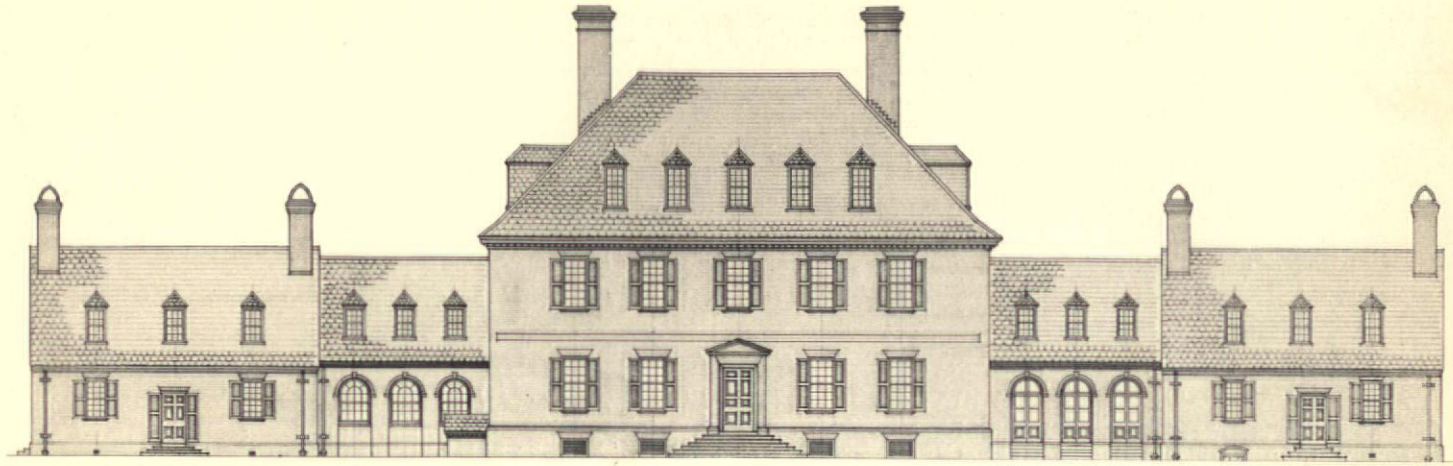



-First Floor Plan-




-Basement Floor Plan-

*Floor plans of Carter's Grove on the James River as restored, 1928–32, for Archibald M. McCrea by W. Duncan Lee, architect*

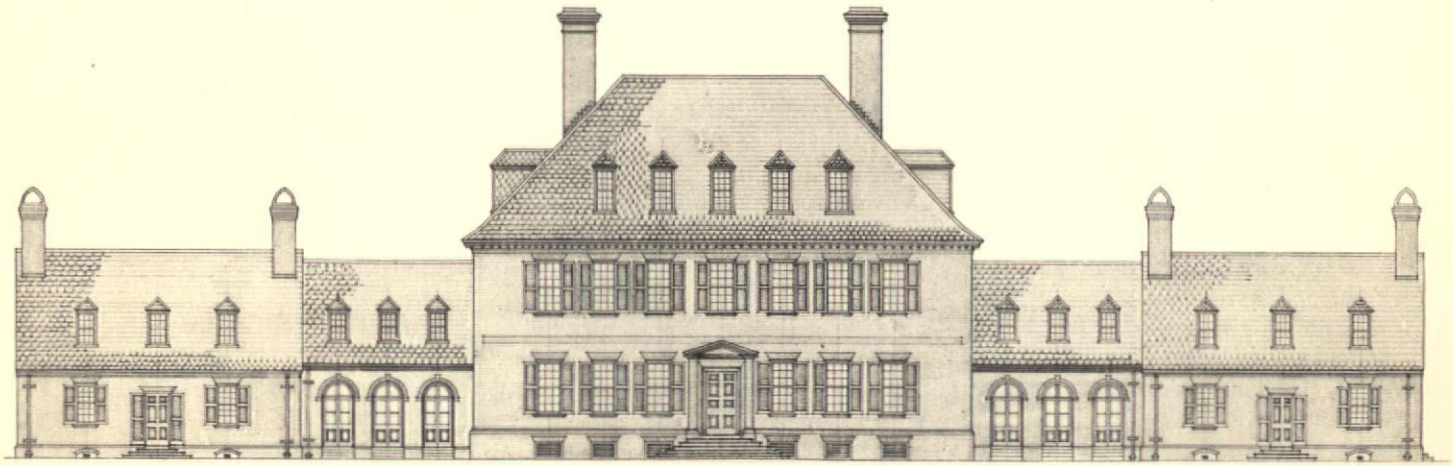


-North or Land Elevation-



-West Elevation-

-East Elevation-



-South or River Elevation-

*Elevations of Carter's Grove on the James River as restored, 1928–32, for Archibald M. McCrea by W. Duncan Lee, architect*



*The hall. The stair treads and risers are of pine, the treads having a walnut nosing nailed on, and these countersunk nail heads are covered by plugs of holly or box in five different designs*



*The kitchen. Mr. Lee built the fireplace and chimney on the original foundations. There is a curious local custom to be observed here in the heavy timber lintel over the corner opening, this timber carrying a brick wall*



*The West Drawing-room. The panelling of pine had not been painted until 1907. It has in the present restoration been cleaned off and left in the original natural finish. The marble is the original, probably brought over from Italy*



*The East Drawing-room. Floor and panelling of pine are entirely the original work. The flooring, incidentally, is of boards 1¼ to 1¾ inches thick, square-edged, dowelled—not nailed—to joists*



*Above, Mr. McCrea's Room, formerly the office. The fireplace is original, but not the woodwork. The large portrait is of Governor Spottswood, an ancestor of Mrs. McCrea's. Below, the riding stable. This is entirely new, but Mr. Lee has used old brick and timbering throughout. The roof is of slate*





*Photographs by Gabriel Moulin*



# Chinese Y. W. C. A. Building, San Francisco, Calif.

## JULIA MORGAN, ARCHITECT

*Above, a general view of the building with its main entrance. It is one wing of a larger residential hotel building of the same organization, the walls of which may be seen above the wing roof. At left, the hallway, looking towards the main entrance on Clay Street. The color scheme is in green and red; the floor, concrete painted while still damp.*



*Detail of the east tower and roof composition. The nearer roofs are of handmade tile, the walls of brick and cast stone*



*A corner of the patio, with its little fish pond. The wall tile above this pond are of a fish-scale pattern in green*

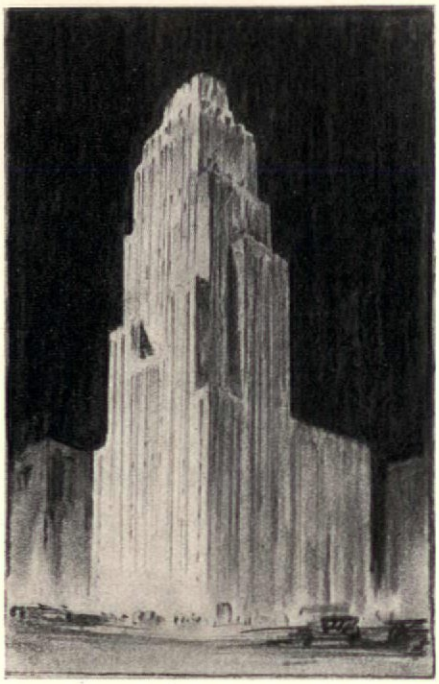


*The entrance lobby in which the color scheme includes a Chinese green, lacquer red, gold and blues. The posts are in red, the ceiling red and green, with stenciling in gold and blues—all lacquered*

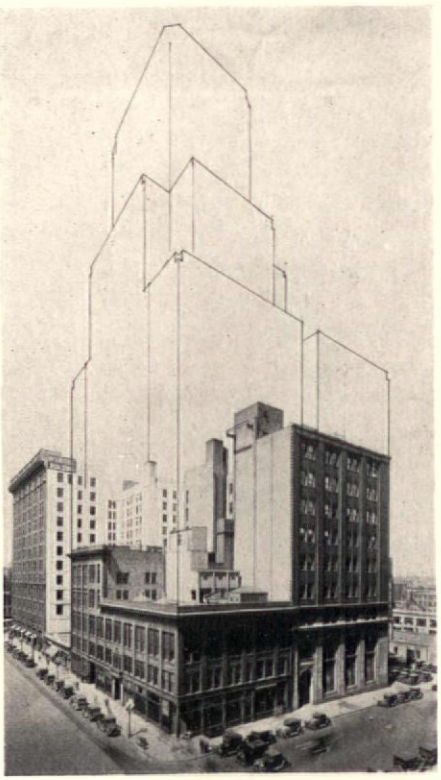
# The Creation of a Telephone Building

## NORTHWESTERN BELL TELEPHONE SYSTEM'S MINNEAPOLIS UNIT AND SOME OF THE UNUSUAL PROBLEMS PRESENTED TO THE ARCHITECTS, HEWITT & BROWN

NEARLY every architectural commission brings its own particularly individual problems, and the Minneapolis Telephone Building had rather more than its share of difficulties. On the site were: one three-story building, one five-story building, and one nine-story building, all used by the Telephone Company to a degree of intensity measured by its need for a much larger structure. It was required of the architects to design and supervise the erection of this new building without disturbance of the existing service—even to the extent of keeping noise from reaching the operators, dust from delicate mechanism, and jar from the myriad electro-magnets of the switchboards. To further complicate the situation, the job was erected during one of the hottest summers on record in that section of the country, and at the height of the building activity the telephone service was further burdened by a large convention, straining the long-distance department to the limit.



*Above, the first rough sketch for the building. Below, the three existing buildings on the site, to be replaced by the building shown in outline*



The three- and five-story buildings lacked adequate strength and ceiling height, and could not be remodelled. During the War, anticipating the advent of the automatic system, the Northwestern Bell Telephone Company entered upon a building programme which contemplated covering the entire site. Certain building laws and height restrictions at that time prevented them from building more than nine stories; a portion of a building was built on the north side of the lot

*A photograph showing the progress of the work on June, 2, 1931*



*A photograph showing the progress of the work on July 27, 1931*



to the extreme height then permissible. War-time restrictions also exercised a decisive influence on the contemplated layout. Finally in 1928–29 the problem of needed expansion was again taken up, and after months of close study the new building was started in the spring of 1930.

As now built, this building is twenty-four stories in height with thirteen stories over the entire property, which is 132 feet by 157 feet, surmounted by an eleven-story tower having two setbacks. There are three basements. The height of the building, however, is equivalent to that of a thirty-story office building. In designing telephone structures, a minimum allowance of 12 feet 6 inches clearance is made for those floors which are to house equipment as compared with a ceiling height in the ordinary office building of from 10 to 10½ feet. The strength of the building is such as to carry 150 pounds live load to a square foot, as compared with the ordinary building with its capacity of about 75 pounds per square foot.

In order to comply with the ordinances and to permit operation within the nine-story building without interruption, it was necessary to build the new structure in five units as follows:

Unit No. 1. That portion of the new structure, up to the height of the nine-story building, on the area occupied by the three-story building.

Unit No. 2. Structure of corresponding height on the area occupied by the five-story building.

Unit No. 3. New structure in the space occupied by rear stairway and chimneys of the nine-story building.

Unit No. 4. New structure within the space occupied by the elevators and lobby of the nine-story building.

Unit No. 5. That part of the new structure from the tenth floor up over the entire area.

In order to provide sufficient exits with stairway and elevator accommodations at all times for the personnel in the nine-story building, it was necessary to erect the fundamental structure of Units No. 1 and No. 2 and install temporary elevators and stairways in them before wrecking that portion of the nine-story building in which Units 3 and 4 were constructed.

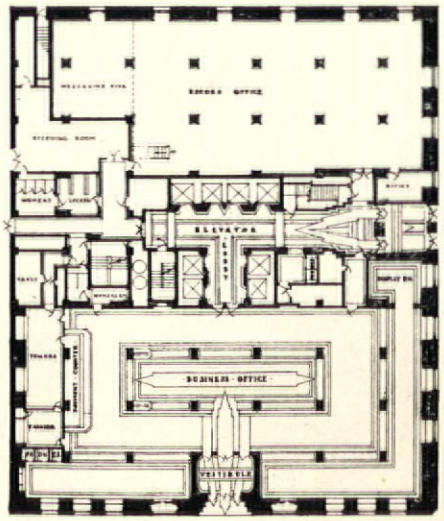
Provision for three basements under the entire structure also presented several interesting problems. It necessitated the demolition and removal of all the basement walls and floors and the footings under the two old buildings and further excavation to a depth of 42 feet below the surface of the street with column footings extended to a depth of 22 feet below the third basement. This placed the bottoms of the caissons for the footings 10 feet below the surface of the Mississippi River above the dam.

Outside of the nine-story building 45 caissons were blasted through rock to that depth and a seam carrying a veritable underground river was encountered a short distance below the river level. To complete the sinking of the caissons below this level necessitated pumping from 1,000 to 1,500 gallons per minute continuously. Incidentally, many interesting and some rare fossils were found in strata from 40 to 50 feet below street level.

Another of the problems encountered in the work of excavation was the terrific street pressure exerted on the



*Progress of the work on August 25, 1931*



*Plan of the first floor*

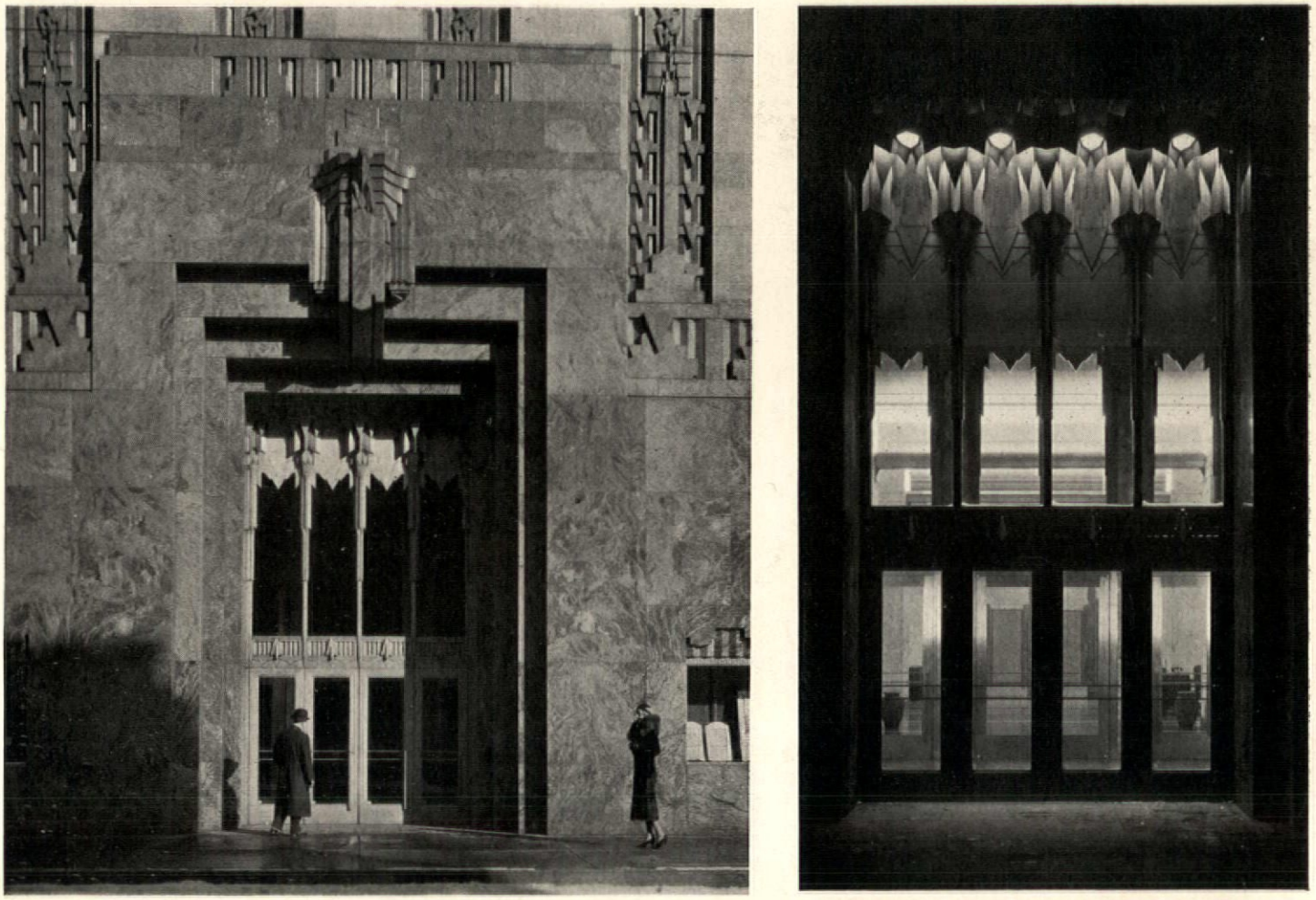


*Progress of the work on October 30, 1931*




*The completed building with its twenty-four stories, thirteen of which cover the entire plot of 132 by 157 feet. There are 237,000 square feet of usable space in the new building as compared with 116,000 in the old buildings. There is a main entrance on Fifth Street and employees' entrance on Third Avenue*

*Photograph by Howson*



Photographs by Howson

*A detail of the Fifth Street entrance to the public quarters, as it appears by daylight and at night*

street side of the pit. This was solved by open cribbing so spaced as to permit the placing through the apertures of the column footings and steel work.

One of the interesting developments on this subject, also, was the use of delayed charges of dynamite in excavating. Because of the danger of interruption and impairment of telephone service by jarring or vibrating the thousands of sensitive relays in the equipment housed by the nine-story building, it had been decided to do all excavating through the rock strata by the "plug and feather" method—a much slower and more expensive method, ordinarily, than blasting.

It was found that by detonating several small charges of dynamite at intervals of fifteen seconds, the same results were obtained without damage to the equipment in the adjacent building. A satisfactory gas exhaust system was devised, enabling the builders to use the delayed charge method in sinking caissons for five additional column footings under the occupied nine-story building.

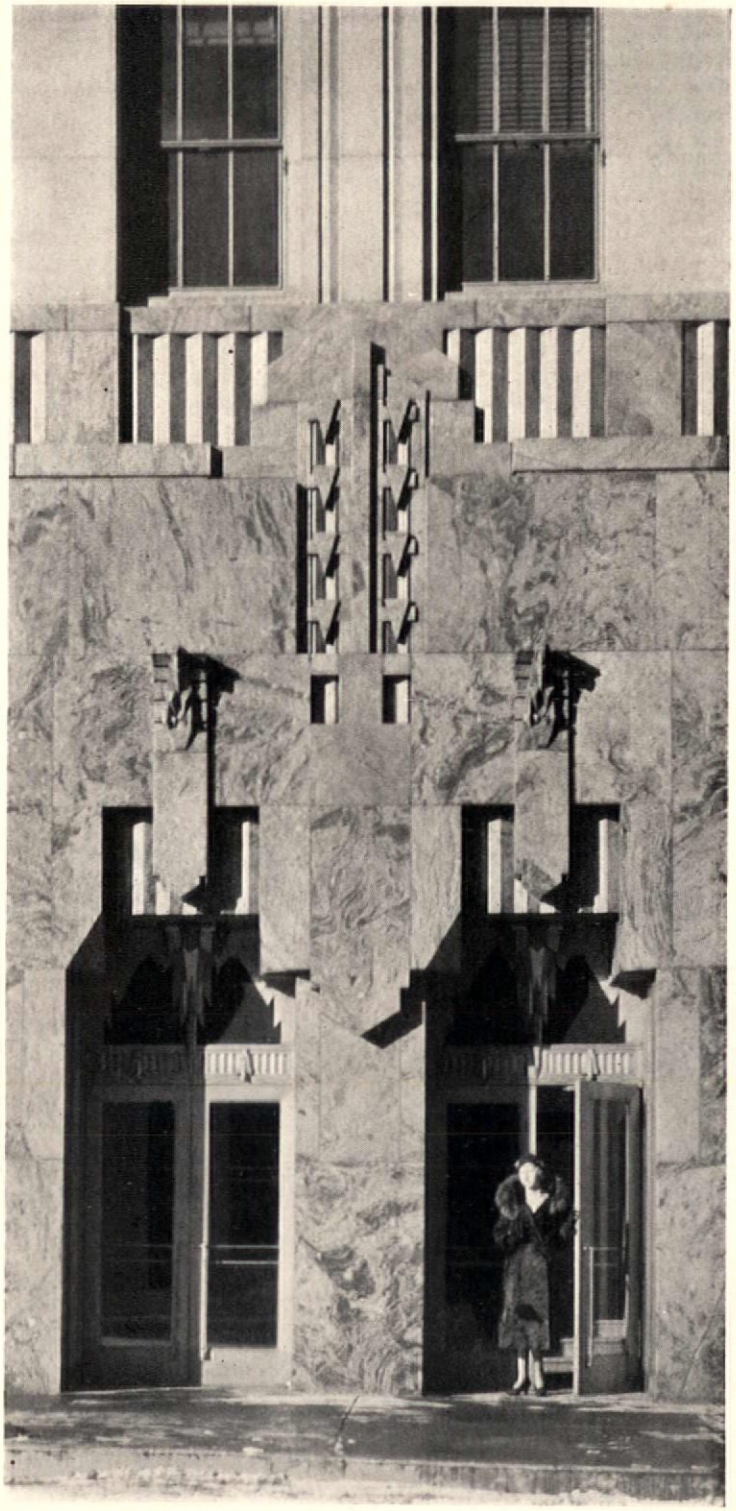
Another interesting construction feature was presented by the refacing of three sides of the nine-story building, replacing windows with new to conform to the new design, all without interfering with the delicate equipment or the operations within. All the above, including the riveting of four additional stories immediately over the long-distance toll rooms, was accomplished without damage or annoyance to the operators. Temporary partitions were erected inside the wall lines on all floors for their protection, these partitions heavily insulated with hair felt, between the faces and around the sides. A temporary system for providing fresh air throughout the rooms was installed. Despite the high temperatures, the presence of dust outside the partitions, and the noise of riveting machines and other equipment, the operators reported very little disturbance throughout the work.

The stripping and refacing operations proceeded from the top down. Two hanging scaffolds were erected two stories apart. The lower scaffold was used for stripping the old walls and

removing the old windows, and the upper one for setting new steel windows and laying new stone ashlar. Before the work was begun all the windows, glass, and stone were on the job. Progress was made at the rate of one story stripped and refaced each week.

The usual procedure of placing compensation insurance was departed from considerably; the owner insisted upon a single policy for all workman's compensation and public liability insurance covering all the crafts and trades on the entire job, the premiums being billed to each organization in proportion to its pay roll. The insurance company assigned a safety engineer to the job, who worked in close co-operation with the resident organization in maintaining safe working conditions. A safety committee was set up consisting of representatives of the owner, the general contractor, the architect, and the insurance company. This committee met weekly to discuss suggestions and plans for the prevention of accidents and the general maintenance of safe working conditions, and short regular weekly meetings were held with all the foremen, so that the necessity of always keeping on the lookout for carelessness was kept before them. There were no unusual or novel protective devices used but as a result of these efforts, which were an innovation on construction work in this area, the record was very encouraging. According to the figures of the insurance company, the losses sustained were 70.5 per cent of the losses normally experienced for an equivalent volume of pay roll based upon the normal Minnesota level.





*The employees' entrance on Third Avenue, as shown in the photograph above by night, and at the right, by day*

*Photographs by Howson*



*Photograph by Howson*

*Detail of the upper part of the tower*



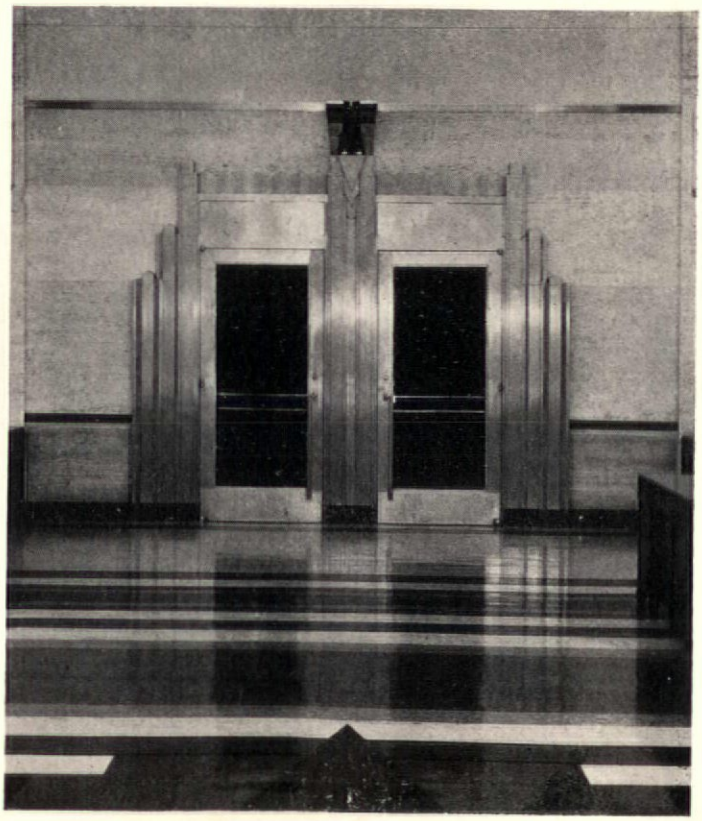
Photographs by Howson

*The central part of the elevator bank on the main floor as seen from the lobby leading into the business office*

*Detail of the mail box in the elevator lobby*



*Double entrance to the elevator lobby from the business office*






Photographs by
I. owson

*One end of the business office, showing the payment counter backed by the cashier's office and tellers' space, with public telephones at the left*

*Below, a view lengthwise in the business office, with the main entrance at the left, and the payment counter directly ahead. The lighting, it will be noticed, is indirect, from the aluminum troughs near the ceiling*



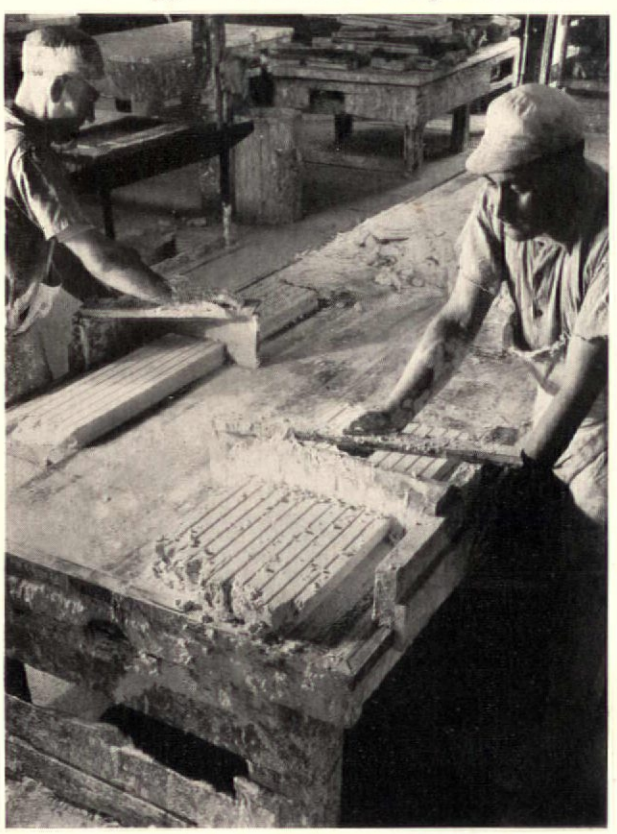


*Making shop drawings of full-size details as derived from the architect's drawings. All full sizes, of course, are measured with a terra-cotta shrinkage scale—13 inches equal 1 foot*

# The Making of Terra-cotta

A PICTORIAL REVIEW OF THE MAIN OPERATIONS INVOLVED IN ITS PRODUCTION AS PHOTOGRAPHED BY F. S. LINCOLN IN THE ATLANTIC TERRA COTTA COMPANY'S PLANT AT PERTH AMBOY, N. J.

*In the model-making shop. Plain units such as ashlar blocks or simple cornice details can be profiled in plaster of Paris. Small ornaments, as rosettes, modelled in clay, can be attached to the plaster model*

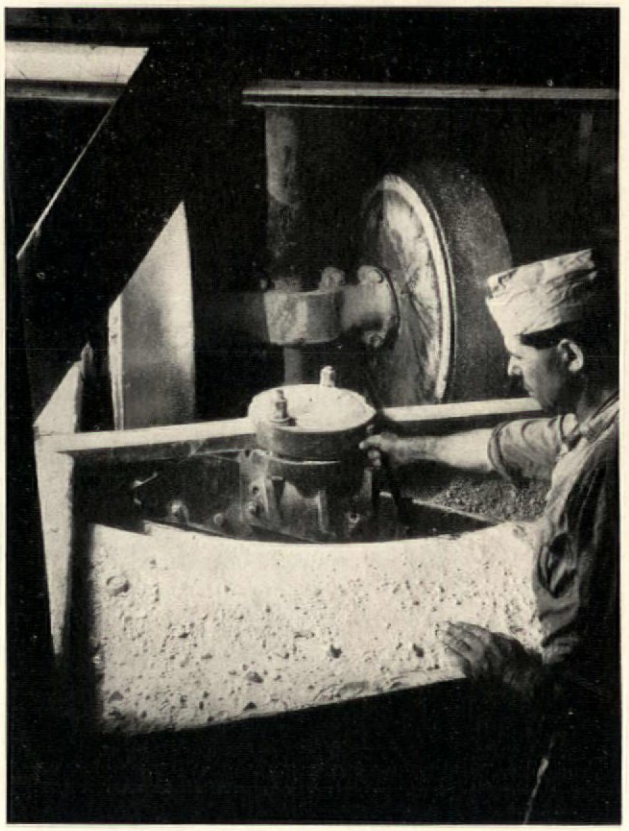


*In the moulding shop. From the original models plaster moulds are here made. From these moulds an almost unlimited number of terra-cotta units can be manufactured, if desired*

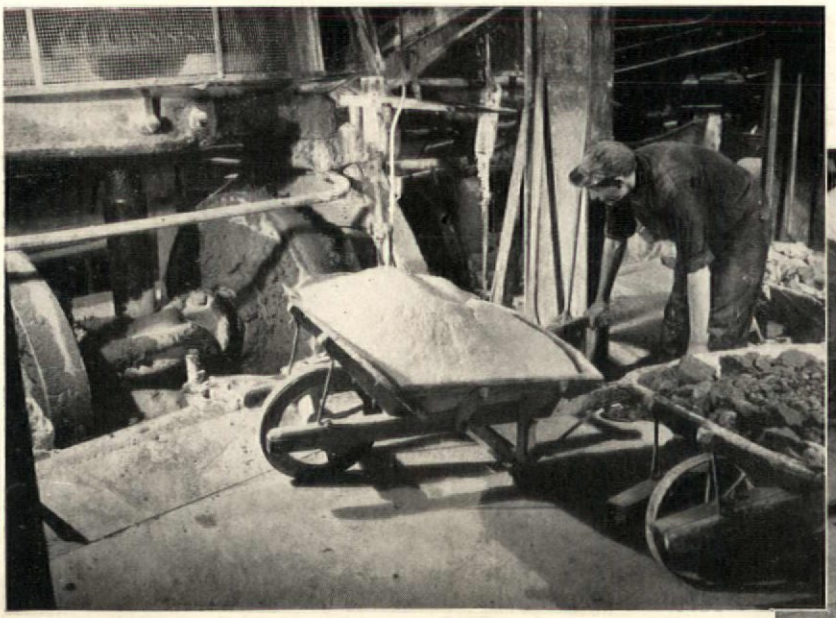




*In the modelling studio. Here all ornamental details that depart from plain surfaces are modelled by sculptors or skilled modellers, to be approved by the architect before moulding*

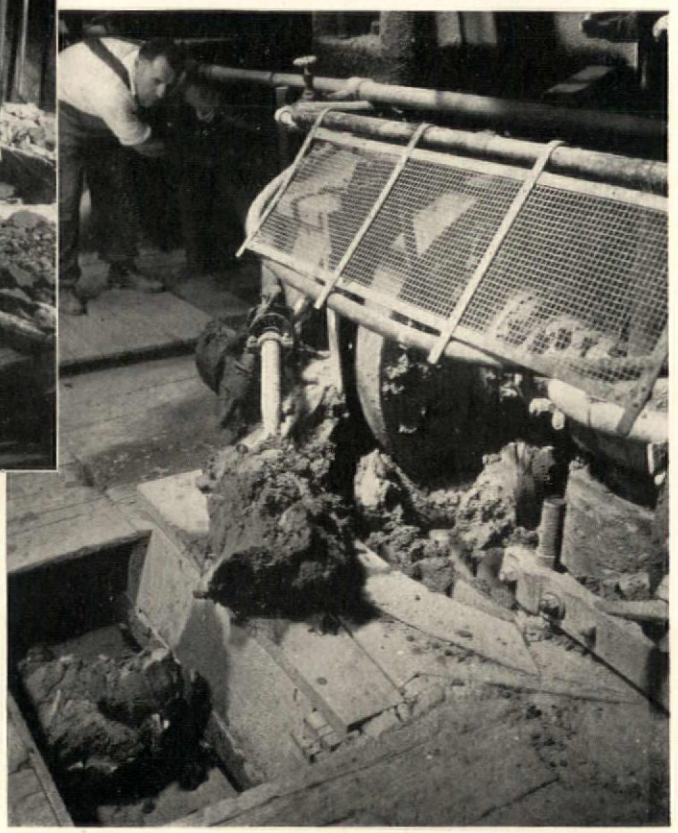


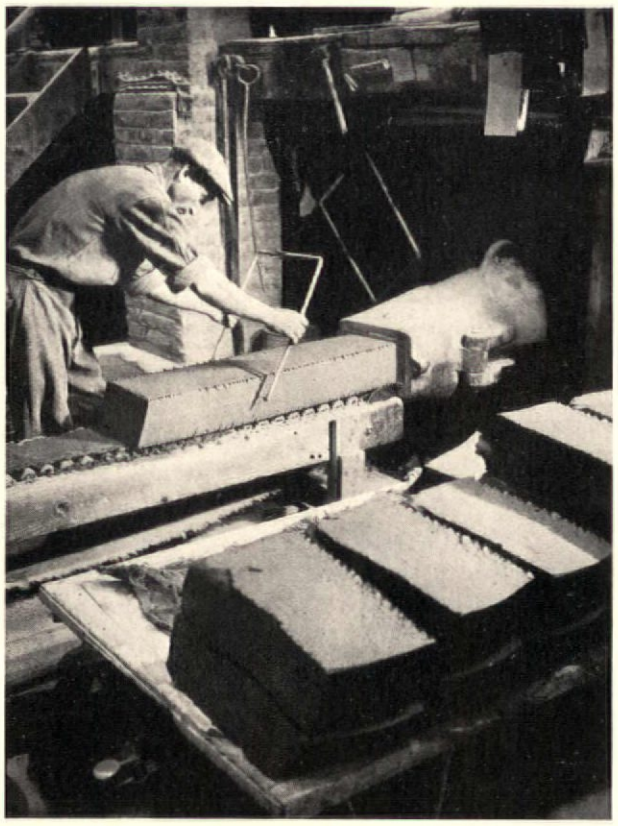
*Here is the process of grit grinding. Previously fired clay is ground to grit, technically known as "grog," and this is added to the terra-cotta clays in order to control shrinkage*



*Clay milling. The clays are selected for definite physical properties such as plasticity, for instance, and are accurately combined to exact formula. About one-third of the mixture is grit*

*Below, clay milling, at the other end of the machine. After the clay body has reached a specific consistency it is removed by large wooden scoops wielded by workmen who must possess strength as well as skill*





*Clay milling again, where the clay is extruded and carried away on an endless belt. A workman cuts the continuous band of extruded clay into pieces that can be handled more easily*



*The pressing department. Here the plastic clay is pressed into the plaster moulds. The clay walls are usually about one inch thick with webs to give the necessary strength and stability*

*Going into the drying tunnels. The pressed pieces remain in the mould until the clay stiffens, due to a slight drying, then the pieces are "finished," and placed in these drying tunnels*

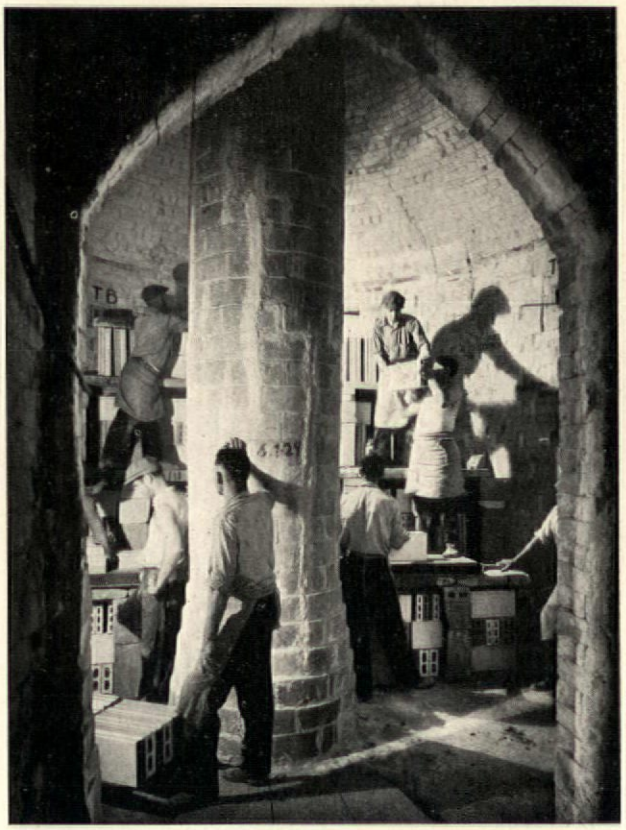




*In the spraying department where, by means of compressed air, the exposed surfaces of the terra-cotta are covered with the ceramic mixture or "slip" which, in the firing, develops the desired color or glaze*



*In the polychrome department, where the colors are applied by hand brush or air brush directly to the clay surface. Abbochrome colors are a mottled combination of three or more tones applied simultaneously*



*Loading the kiln. The clay pieces are carefully placed in large kilns which are of the muffled type. That is, the flames and combustion gasses pass through flues without touching the terra-cotta*

*Firing the kiln. The heat is gradually increased until the temperature reaches 2300° F. Then the fires are dropped and the kilns are allowed to cool, causing a slow annealing of the terra-cotta*



*After firing, the terra-cotta is temporarily assembled, the joints being squared and cut to proper alignment or size. Here each piece is numbered to denote its position in the building*





*Photographs by Samuel H. Gottscho*

# The Architectural League's 48th Annual Exhibition

GOLD MEDAL IN ARCHITECTURE.—To Henry R. Shepley, of Coolidge, Shepley, Bulfinch & Abbott, for the New York Hospital. This award is made for the orderly arrangement of the many and varied parts of an unusually complex problem, and the excellence of plan and originality of the design.

GOLD MEDAL IN ARCHITECTURE.—To Thomas Harlan Ellett for the design of the Cosmopolitan Club, New York City; a fresh and personal interpretation, beautiful in its simplicity of form and material.

GOLD MEDAL IN DECORATIVE PAINTING.—To Thomas H. Benton for his decorations in the Whitney Museum in recognition of the freshness of his viewpoint, the vigor and mastery of his technique, and the authentic originality of his work.

GOLD MEDAL IN SCULPTURE.—To Leo Friedlander for the distinguished and monumental qualities shown in the studies for the Arlington Memorial Bridge Equestrian Groups, and for the originality in his work as displayed in its relation to architecture.

GOLD MEDAL IN LANDSCAPE ARCHITECTURE.—No award.

GOLD MEDAL FOR DESIGN AND CRAFTSMANSHIP IN NATIVE INDUSTRIAL ART.—To Joseph Urban for his model of a stage setting for a religious pageant and play. The award is for excellent craftsmanship and design used in a dramatic manner and in keeping with its grand purpose.

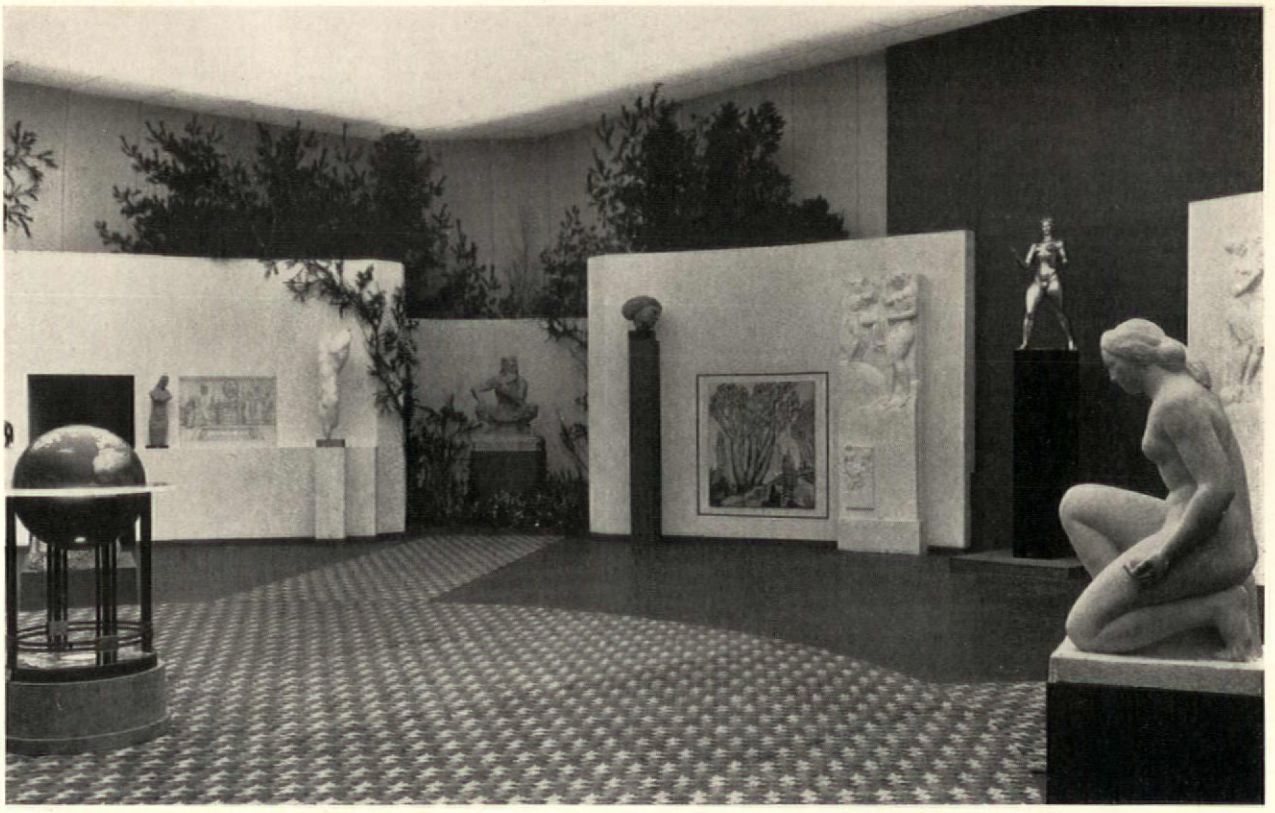
MICHAEL FRIEDSAM MEDAL.—To George G. Booth, Founder of Cranbrook Foundation, Michigan, for the establishment of the Cranbrook Foundation at Bloomfield Hills, and for his far-reaching knowledge and help in the field of Art in Industry.

HONORABLE MENTION.—To Harvey Stevenson, of Harvey Stevenson, Thomas & Studds, for the Peter B. Olney House; for the simplicity and balance of mass, the restrained handling of details in sympathy with the materials, and a quality of comfort and quiet dignity which may be enjoyed and bequeathed to later generations.

AVERY PRIZE FOR SMALL SCULPTURE.—To Benjamin Franklin Hawkins, for Fountain for Day Nursery.

BIRCH BURDETTE LONG MEMORIAL PRIZE.—To John Wenrich for his rendering of Building No. 1, Radio City, and in recognition of his sympathetic and highly artistic presentation in color of architectural subjects.

THE PRESIDENT'S MEDAL.—To Joseph Urban for his architectural treatment of the Galleries of the American Fine Arts Society Building as a setting for the present League Exhibition, and for his effective installation of the exhibits in the show.



*Joseph Urban's setting for and presentation of this year's exhibition gave it a unity which previous exhibitions have rarely attained. The color scheme is of white and red for the walls, the carpet being in yellow, orange, and green. The ceiling of the high galleries was lowered by stretching muslin over a grille of wires diffusing through this the lighting from above*



# The Editor's Diary

*Friday, January 27.*—Went to the formal opening of the new Home Office Building for the Metropolitan Life Insurance Company, in which Dan Everett Waid and Harvey Wiley Corbett have produced a well-balanced combination of essential machine and attractive working environment. Just half of the building has been finished for the present, that half costing, I should judge, well over ten millions. The invited guests were taken through the building in groups, and I was fortunate enough to find myself with Chester Aldrich, Dwight James Baum, George Licht, and Robert J. Reiley. We were particularly lucky in being shown the work by Richard A. Tissington who, Mr. Waid tells me, has been very largely responsible for the detail design of the building. All of the working space is air-conditioned; some of the floor area, I should judge, is fully eighty feet from a window, so that indirect lighting is used, increasing in intensity with the distance from the window. The ceiling, all of acoustic tile, steps up in six-inch lifts from a low in the interior to just above the windows, thus providing the large amount of space needed for ducts without cutting off the daylight that would have been lost by furring down the whole ceiling. There are fourteen thousand people served with lunch in the basements on each working day—some of them from the adjoining building. The problem of conveying this population from the various departments to the basement and back was a difficult one. Mr. Corbett tells me that the first draft of the elevator engineers left practically no space in the building for anything but elevators. By a staggered schedule over two and a half hours, special elevators convey each department to the cafeterias in the basement. The stream through the latter is constant, and after lunch the employees find their way to the first floor by escalators, using the elevator system from the first floor back to their respective departments.

Three intellectual bouts were put on tonight in Sloane's gallery, opening the exhibition of works by unemployed draftsmen. William Sloane Coffin, president of the Metropolitan Museum, presided, the subject discussed being "The Picture in the American Home." Two architects, two decorators, and two painters argued respectively their points of view. H. Van B. Magonigle and Ely Jacques Kahn represented the architects; Horace B. Moran and Eugene Schoen, the decorators; with Hobart Nichols and Leon Kroll presenting the side of the painters. It was a good evening's entertainment, touching lightly on such far-reaching questions as: "Did the coming of the easel picture distort the logical age-old progress of wall decoration?" "Should an interior be an entity in itself to induce a mood, or should it be a background for pictures?" "How much right has a man, unskilled in design, to create his own environment? If we admit that he may live for himself as he pleases, what about his family and his guests?" "Has any good easel painting a chance to deliver its message effectively excepting under some such custom as that followed by the Japanese in their *tokonoma?*" All of which, it will be seen, furnish more than enough material for an evening's discussion.

*Monday, January 30.*—Milton F. Kirchman, a graduate student of New York University's College of Fine Arts, makes an interesting point in an article published in the college paper, *The Column.* His point is that either our criticism of architecture is defective, or else architecture itself does not explore the realm of emotion. In painting or in music we ascribe qualities in a work of art to the personal equation—we say that a composition is morbid, moody, fanciful, light-hearted. Architecture undoubtedly has been in certain periods marked by the personality of the age or of the location. Rococo was definitely an emotional expression, Baroque another. Has architecture of today become merely a mathematical matter of volume and of lines?

*Tuesday, January 31.*—Charles F. Abbott, executive director of the American Institute of Steel Construction, is found among the growing ranks of those who see clearly the need for a real programme of public works put into effect to halt the downward spiral. It is a curious thing that in the restrictions governing the R. F. C. loans there is the inexplicable provision that loans on self-liquidating projects are made at five to six per cent; loans for direct relief may be had at three per cent. In other words, we prefer to make it easier and cheaper for the State to borrow for a dole instead of for useful labor. With the need for relief doubling each year in geometrical progression, it is obvious that providing work instead of a dole for the present twelve million unemployed is the only way out.

*Wednesday, February 1.*—David M. Dunning, Jr., an engineer connected with the New York State Temporary Emergency Relief Administration, met with the architectural editors at luncheon today, and told us something of the startling growth and difficulties of relief needs. It seems very hard to arouse smaller communities to the realization that they have community needs which might well be undertaken in these times when the Relief Administration fund pays for the labor involved. Instead, many of these communities say in effect: "We need nothing that we know of, but we are slowly starving to death." Possibly the answer is that any community so moribund as to know of no way in which it can improve itself, deserves to starve.

*Thursday, February 2.*—Charles C. Zantzinger over from Philadelphia. He tells me that the "renovizing campaign" instituted in that city is apparently producing results. The city was districted, and individual solicitors in team groups called on property owners to have them agree to spend money on necessary or desirable building, remodelling, or renovating. The total pledged in this way, I understand, was about sixteen million dollars. There is no check-up, I believe, as to whether this money is being spent, but the announcement of the fact alone seems to have been of some service in stimulating business.

*Tuesday, February 7.*—Joined the illuminating engineers at the International Music Hall this morning to have a look at some of the electric achievements therein contained. Figures as to wattage, size of switchboards, number of lamps, and that sort of thing, are tiresome and mean little, except to the engineer. Three outstanding factors, however, seem today to constitute practically the whole of any lighting problem. The three seem rather commonplace and trite, yet their full recognition is perhaps even now not always found. In the first place, the illuminating engineer considers comfort and necessity in visibility. He must provide enough light for the task of the occupant. The second consideration is the architectural necessities—are there to be many sources, or only one, and what form may these take? In the third place, the illuminating engineer is enabled, partly by his control of color, quantity, and direction, to induce the desired moods in the occupants. One particular characteristic that is emphasized in the achievement of Clyde R. Place, Eugene Braun, and Professor S. R. McCandless is that these men are no longer satisfied to have mere light sources; instead, they utilize directional light in every single one. The great chandeliers in the main foyer, for example, are designed to throw all the light down; to another set of sources, hidden in the ceiling, is given the task of lighting the murals, and incidentally, by a nearly white light,

rather than by the amber light coming from the visible ceiling fixtures and side wall brackets on the mirrors. These latter, incidentally, are designed to throw all their light horizontally; and so with every source, whether it be one of the many lighting the stage, or one lighting a lady's face before a mirror in the powder room.

*Saturday, February 11.*—In the matter of museums, the American Federation of Arts reports that during 1932 eleven new museum buildings were brought to completion, the average cost of which was a million dollars. Gifts and bequests to museum funds, normally about half a million dollars, amounted to well over five millions. Another interesting, and not surprising, finding of the association is that the interest in and sale of prints have been increasing rapidly at the expense of easel paintings.

*Wednesday, February 15.*—Bela W. Norton dropped in to tell me of the progress being made in Mr. Rockefeller's Williamsburg restoration project. The work contemplated at the outset, providing for the rebuilding of the capitol, governor's palace, and the restoration of Duke of Gloucester Street, is nearing completion. The palace and the capitol are enclosed, so that they are coming to an end of the work. Not that the whole town is to be considered finished, for as time goes on there will doubtless be other minor buildings rebuilt or restored, all depending, I suppose, upon the public's reception of Mr. Rockefeller's efforts. It is unlikely that there will be any comprehensive publication of the work for some time to come, since there is much to be done in landscaping.

*Friday, February 17.*—The Forty-eighth Annual Exhibition of The Architectural League opened last night with the usual ceremonies, excepting that the announcement of awards was put off until the twenty-fifth.

The Show is utterly different from anything that has been done before. Joseph Urban has turned the old galleries in the American Fine Arts Building into such a homogeneous unit that one is first impressed with the setting, and only secondarily and long afterwards with any intrinsic interest of the exhibits. In a word, it is a show, rather than an exhibition—and a very effective show at that.

The usual League affair is so overflowing with new creations, new ideas, beautiful achievements, that one is utterly unable to assimilate the whole without repeated visits. This year, however, the lack of buildings recently completed, and the general demoralization of the profession, has had its effect. Among the chief items that one finally singles out are Coolidge, Shepley, Bulfinch & Abbott's Cornell-New York Hospital; John Russell Pope's Yale gymnasium; Thomas H. Ellett's Cosmopolitan Club in New York City; a group of Frank Forster's romantic country houses; Delano & Aldrich's Yale Divinity School; Paul P. Cret's now rather familiar Shakespeare Library; Edwin H. Hewitt's Minneapolis Telephone Building; and a number of good country houses, including a particularly charming one in brick by Harvey Stevenson, Thomas & Studds.

The Show is divided into three main parts, with an additional corner off the hall devoted to a particularly impressive exhibition of modern housing here and abroad. Of the three main parts, the first as one enters is given over to theatre design in its many forms, ranging from Robert Edmond Jones's marionettes, to individually lighted models of stage settings.

The second division is given over to architecture and landscape architecture, while the Vanderbilt Gallery itself, the third and largest unit, contains the sculpture and mural painting. I must confess to a feeling of disappointment in the last named division. With the exception of Thomas Benton's original sketches for the Whitney Museum murals; Leo Friedlander's superb but tiny plaster model of an equestrian group for the Arlington Bridge; D. Putnam Brinley's sketch for one of his Huckleberry Finn subjects; and Benjamin Hawkins's dolphin fountain for a day nursery, I found little to hold my attention.

In speaking of the housing exhibit, Clarence Stein tells me that this material is to be used as a travelling unit under the guidance of the A. I. A. Committee on Housing—a sub-committee of the Committee on the Economics of Site Planning and Housing. Cities in which there is sufficient public interest to have the exhibit may arrange for this through the committee merely by paying the cost of transportation, boxing, and insurance.

*Tuesday, February 21.*—With Edmond R. Amateis to see what the returning men from The American Academy in Rome have been doing, as exhibited at the Grand Central Art Galleries. Some of Burton Kenneth Johnstone's architectural drawings are particularly good, and the work of Sidney Biehler Waugh in sculpture shows great promise. We were fortunate in meeting Miss Brenda Putnam, an exhibition of whose work was in an adjoining gallery. It was a treat to see and discuss with Miss Putnam some of the things she has been doing, among which we were particularly interested in the Puck for a fountain of the Folger Library, a marble portrait head of Amelia Earhart, a particularly lovely portrait in marble of a three-days'-old infant, and, among Miss Putnam's latest work, "Midsummer." I was struck by the fundamental difference in viewpoint between Amateis and myself; to his sculptor's mind the subject was of secondary importance, the artist's facility of expression and technique the things that held his interest. Lacking his sensitive feeling for these sculptural nuances, I was impressed rather by the subject and the more obvious merits of the interpretation. "Midsummer," for instance, seemed to me little more than a fat woman; to Amateis it was a highly successful effort to express the marvellously intricate and voluptuous folds of flesh.

*Thursday, February 23.*—The English language is a rather unsatisfactory instrument in some ways. As an example, when we were collecting the material for the Portfolio in this issue on the subject of verandas, the question of the proper title came up. What are the differences between a veranda, a porch, a piazza, a portico, a loggia, an arcade? Even architects use these terms interchangeably to a large extent—a practice that is fairly well justified by the dictionary. Here are the Standard Dictionary's definitions:

Veranda—An open portico or gallery extending along one or more sides of a building.

Porch—A covered structure forming an entrance to a building; outside and with a separate roof, or as a recess in the interior as a kind of vestibule.

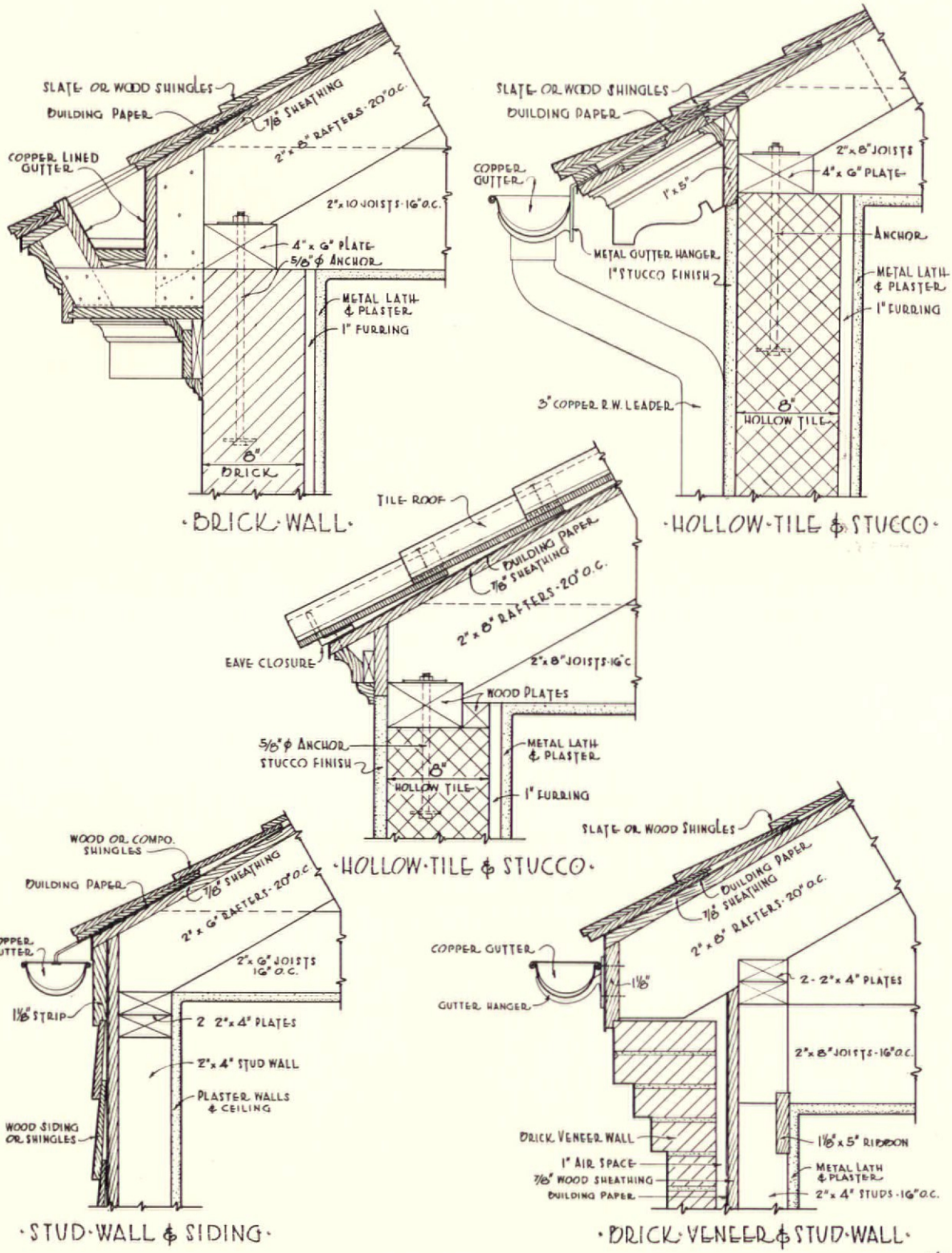
Piazza—A covered and usually colonnaded walk or gallery on the outside of a building; from the erroneous seventeenth-century application of the word to the arcades in the Covent Garden, London. Hence a veranda or porch.

Portico—An open space or ambulatory, with roof supported by columns, sometimes as a detached colonnade, but generally as a porch before the entrance to a building.

Loggia—In Italian architecture (1) a covered gallery or portico, especially when in the upper part of a building, having a colonnade on one or more sides, open to the air. (2) A large ornamental window, often projecting from the wall, and forming a chief feature of the design, as frequently in Venetian architecture.

Arcade—A vaulted passageway or street; a vaulted roof.

If one can sift any definite conclusions from all of the above, I suppose it might be that a porch belongs inseparably with an entrance. The examples in this month's Portfolio, it will be seen, are not entrance porches, and possibly some of them are not, truly, verandas, but there seems to be no other inclusive term for this sort of outdoor living-room.




# · VARIOUS · RESIDENTIAL · EAVE · DETAILS ·

## A Series of Working Drawings by Jack G. Stewart

· SCALE 0 1' 2' 3' 6" 9" 1'0" ·

· PLATE · No. 35 ·

# BOOK REVIEWS

THE HOMES OF THE PILGRIM FATHERS IN ENGLAND AND AMERICA (1620–1685). By MARTIN S. BRIGGS. 211 pages, 6 by 9 inches. Illustrations from photographs and drawings. New York: 1932: Oxford University Press. $4.75.

There has been no lack of literature relating to the Pilgrim Fathers themselves, but of the homes of the settlers, built during the first sixty years after the landing at Plymouth, we know very little. The author starts his researches with the English towns from which the early settlers came, follows their movements in Holland, and notes the Dutch influence on their architecture. With this background and a careful search among contemporary chronicles, he is able to reconstruct, at least more fully than has ever been done, the early homes of the Pilgrims. The author is not satisfied with mere superficial resemblances, but takes up in detail matters of plan, primitive timber construction, the making of doors, finished woodwork, and hardware.

HOMES AND GARDENS OF ENGLAND. By HARRY BATSFORD and CHARLES FRY. Foreword by LORD CONWAY of Allington. 62 pages of text and 175 plates, 6½ by 9 inches. Illustrations from photographs, plans, and drawings. Printed in Great Britain. New York: 1933: Charles Scribner's Sons. $3.75.

There is surely no lack of literature on the homes and gardens of England. Messrs. Batsford and Fry, however, have felt that there was a distinct need for a comparatively small and handy book that would cover the subject for the general reader without the detailed requirements of the student of architecture. The illustrations are good and, among the well-known examples illustrating the various periods, there will be found a number of smaller and less familiar ones.

INVESTIGATION OF WARM-AIR FURNACES AND HEATING SYSTEMS. Part V. By ARTHUR C. WILLARD, ALONZO P. KRATZ and SEICHI KONZO. 158 pages, 6 by 9 inches. Illustrations from photographs and diagrams. Bulletin No. 246. Pamphlet binding. Urbana, Ill.: 1932: Engineering Experiment Station, University of Illinois. 80 cents.

This bulletin is the eighth to be published under a co-operative agreement between the National Warm-Air Heating Association and the University of Illinois. A research in warm-air furnaces and furnace heating systems was begun in October, 1918.

HYDROTHERAPY IN HOSPITALS FOR MENTAL DISEASES. By REBEKAH WRIGHT. Foreword by JAMES V. MAY. 396 pages, 6 by 9 inches. Illustrations from photographs and plans. Boston: 1932: The Tudor Press, Inc. $3.

The architect will find herein specific recommendations for the design of hospital construction in the hydrotherapy departments. It is quite evident that the author of the foreword, Doctor James V. May, superintendent of the Boston State Hospital, has little faith in the present status of the architect's knowledge regarding these requirements. He is of the opinion, rather, that hospital construction, as a whole, should be planned by hospital physicians.

MOUNT VERNON. Its Owner and Its Story. By HARRISON HOWELL DODGE. Edited and arranged by EDWIN BATEMAN MORRIS. Introduction by OWEN WISTER. 232 pages of text and 31 illustrations, 5½ by 8 inches. Illustrations from photographs. Philadelphia: 1932: J. B. Lippincott Co. $2.50.

Colonel Dodge has been resident master of Mount Vernon for nearly forty-five years—longer, of course, than George Washington's term of ownership. He knows every brick, shingle, and boxwood plant of the place, and shows a marked ability to infuse the reader with his own enthusiasm. A large part of his reminiscences, of course, deal with the visitors who have come to see the nation's shrine in these decades—practically every well-known personage who has visited America.

TOWN AND COUNTRYSIDE. Some Aspects of Urban and Rural Development. By THOMAS SHARP. 224 pages, 7 by 9¾ inches. Illustrations from plans, maps, and photographs. Printed in Great Britain. New York: 1932: Oxford University Press. $4.50.

Here is a stimulating book by a man who is more than perturbed over the fact that England is destroying the character of her towns and also of her countryside despite the garden cities and suburbs of which she is so proud. Mr. Sharp agrees with Trystan Edwards in his belief that the art of civic design has been killed by the science of town planning. The diffusion of towns resulting from our trying to make them look like the countryside, and the ruling of straight motor roads and high-tension lines across the countryside, are practices that will, if they have not already done so, kill all the beauty and character of the town and of rural England.

BAROQUE GARDENS OF AUSTRIA. By G. A. JELLICOE. 40 pages, 12 by 17½ inches. Illustrations from photographs, plans, and old prints. Printed in Great Britain. New York: 1932: Charles Scribner's Sons. $25.

There is an unmistakable individuality in the gardens built under the Habsburg Dynasty, even though there are distinct echoes of Italy, France, Spain, the Netherlands, Turkey, and North Africa. Mr. Jellicoe's scholarly and beautifully presented study of these Baroque gardens was made possible through the Bernard Webb Studentship at the British School at Rome. The drawings, which are plentiful and well executed, were finished by Alison Shepherd. The contrast of the gardens as shown by old prints with photographic records of today, comprise one of the most interesting features of the work.

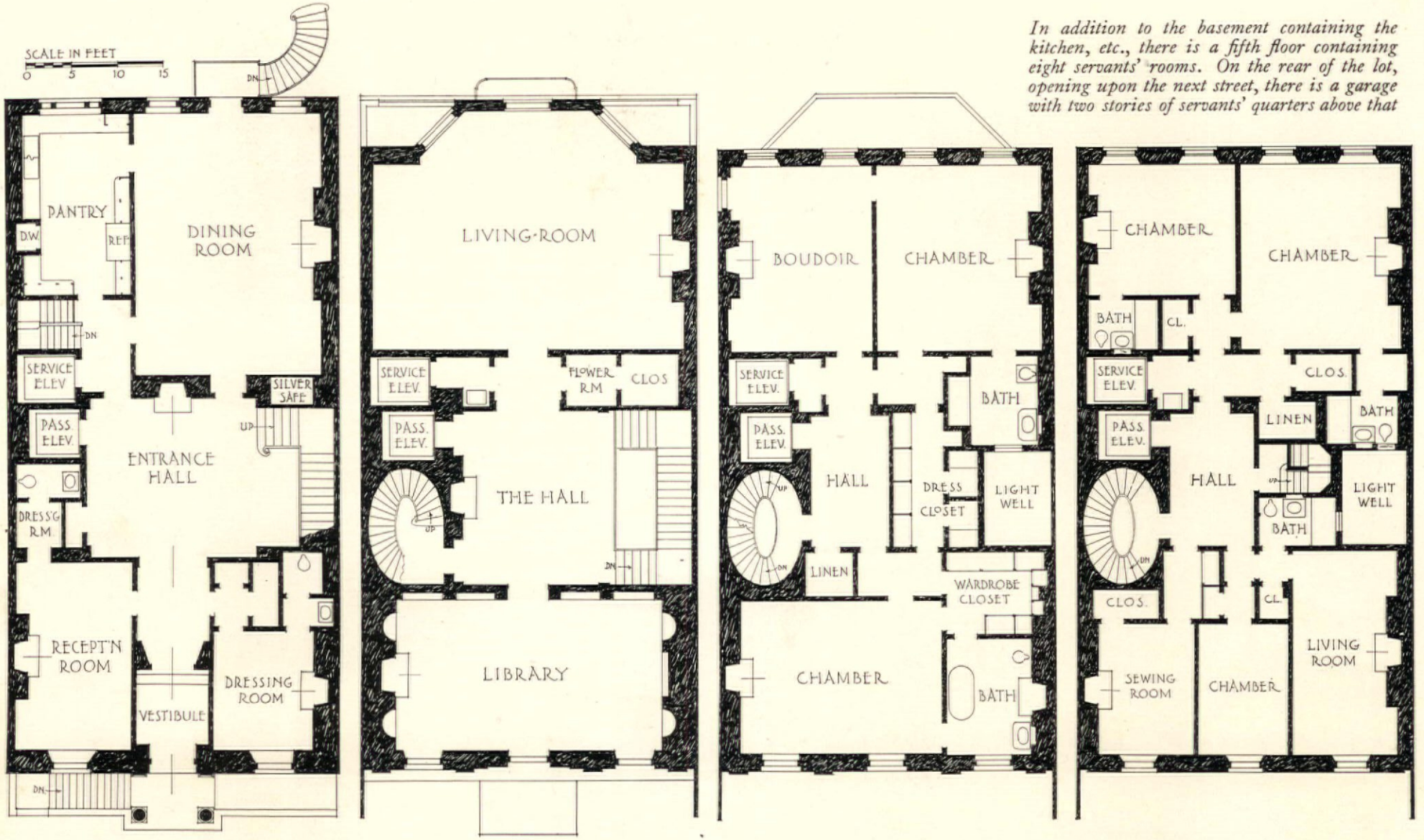


*Photographs by Mattie Edwards Hewitt*

MOTT B. SCHMIDT, ARCHITECT

# House of Vincent Astor, New York City

*In addition to the basement containing the kitchen, etc., there is a fifth floor containing eight servants' rooms. On the rear of the lot, opening upon the next street, there is a garage with two stories of servants' quarters above that*



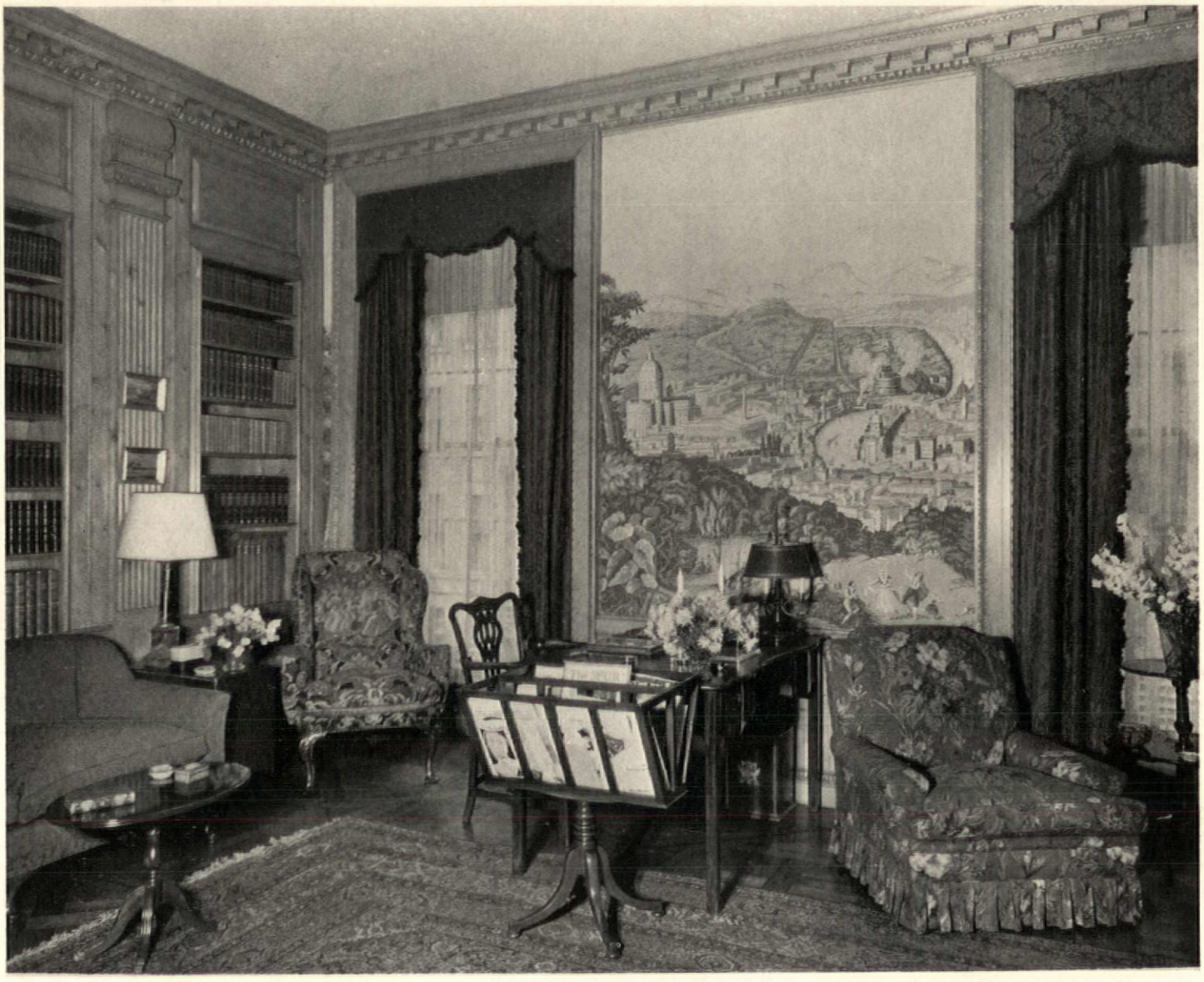

*First floor* *Second floor* *Third floor* *Fourth floor*



*The hall at the top of the stairs leading up from the entrance hall. Allyn Cox painted the walls in his individual realistic style. The niche is, of course, perfectly flat, and the stair railing of wrought iron, polished and lacquered, is painted in facsimile on the far wall. The floor is of yellow Verona and Alabama cream marbles, with a black edge*



*The entrance hall, with a glimpse of the dining-room beyond. The floor is of black, white, and yellow Verona marble; the stairway of Belgian black marble with a yellow carpet. The dining-room beyond is panelled in pine, painted white*



*A corner of the library. It will be noticed that the book shelving has been changed somewhat from the niche motive shown on the plan. The woodwork is of waxed pine, the hangings of green damask. The wall panels, of which one appears here, are of old French wall paper in sepia, representing the cities of Europe*



*In the living-room the walls are painted a bluish green taken from an old panelled room in the Philadelphia Museum. The dado and the cornice are carved wood. For the hangings light beige damask is used over under-curtains of flame-colored taffeta, with gauze sash curtains matching the wall color. The floor is an old French parquet; the mantel, an antique of white marble with color marble inlays*



*A glimpse of the hall through the living-room doors. These doors are of old San Domingo mahogany, veneered, with old English chased brass locks. The door surround is of carved wood*



*The reception-room on the first floor, into which has been fitted an authentic Louis XV boiserie painted by Huet and Perrott. The general color scheme of this painted panelling is red and gold with overdoors in blue and gold. The rug is an eighteenth-century Samarcand woven with silver thread*

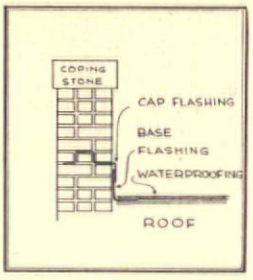
# Some Pitfalls in Supervision

*By W. F. Bartels*

## XXX. ROOFING AND SHEET METAL

*(CONTINUED)*

GENERALLY when stone or brick walls project above the roof, the flashing is in two sections: the cap flashing and the base flashing. The cap flashing should extend into the wall within an inch or so of the other side. Of course the contractor's money—in the form of time and material—can be saved by extending the metal only a short distance through the wall: hence the superintendent must be on his guard. The cap flashing may be of the plain type which should step up; that is, in a brick wall, extend in over one brick, turn up over another, and thence to the outside. Or, the flashing may take the shape of an inverted "U" in order to avoid any chance of loosening the bond in the wall. An interlocking type prevents loosening the flashing in a wall by binding into the mortar, thereby preserving the solidity of the wall. Another type of flashing has an insert for the base flashing.




All cap flashing should be well lapped, and extend down over the base flashing three inches. Base flashings should preferably be set in the waterproofing—hot pitch, then nailed down. The roofer is apt to argue that the top layers alone will be adequate insurance against leakage, but the superintendent must be adamant in insisting on the forementioned practice. The top edge should fit tightly against the wall and extend well under the cap flashing. The base flashing should extend at least six inches above the high point of the roof. It is disconcerting for a superintendent to find on examination that the base flashing extends up only a half inch or so under the cap flashing. All flashing around pipes, flag poles, etc., must be given careful consideration. Flashings for valleys must be carefully lapped and soldered where necessary. Flashing for chimneys should be well built in while the job is under construction, in order to render masonry operations unnecessary after the building is completed. The metal should go through the chimney and turn up several inches around the flue. This will prevent those disagreeable decorations at the roof line noticeable around so many chimneys. In the case of beams exposed to the weather in fireproof structures, covered by rules regarding fire towers, etc., they are generally first covered with concrete and then with a metal protection. The metal protection should extend well into a raglet and be properly calked.

Once, while inspecting a building which the owner was forced to take over from the builder in the course of construction, I recommended that copper flashing be put around the stair bulkhead. The flashing was to have its edge turned and inserted into a raglet of at least 1½" depth, calked tightly with lead, and finally with an elastic calking compound. All this was agreed to and the work started. I watched the man and noted his progress. The mason had not skimped on the cement, and the mortar between the bricks was hard. Coming back the second day I was amazed to see not only the flashing completed, but the raglet calked. I inquired how many men had worked on it. The foreman naïvely told me, "just the one man." From this I knew that the raglet could not have been made 1½" deep and that the calking could never have been finished by one man in such short order. So, despite the assurance that the "flashing was all right," I jerked a piece out. It was easy to do. It extended inward only about ¼", was not turned, and, instead of lead calking, had only an elastic calking compound. Needless to say I required an inspection and approval of each step on the job thereafter. Proper workmanship may easily be done, *during construction*, at a relatively low figure.

And not to be forgotten are the specification provisions for the flashing on wood window heads, window sills, and other weather stops that the architect has seen fit to require. In all this work it will be well for the superintendent to remember that although water will not run uphill of its own accord, it will go anywhere under pressure—and this is the condition which exists in a driving storm.

A superintendent was once asked to find the cause of a wet floor in a large one-story building having a well furred brick wall. After

each hard storm water would appear on the first floor just inside the wall. The brickwork was well laid up and the roof apparently did not leak. Finally it was decided that the only way to find out was to try one section at a time with the aid of the local fire department. First the wall was kept wet continually for several hours but no water appeared. Then the roof was deluged. No spots or evidences of a poor roof appeared, but the water again appeared on the floor. Then the inspector donned rubber coat and boots and went up the ladder. The gutter was too small to carry the water off, but the difficulty did not lie there. The flashing appeared to extend well up under the shingles. However, the gutter was made up of two pieces. One was fastened to the top of the wall and formed the exterior portion of the gutter, while the other served as flashing and gutter. Their junction was not soldered and hence before the gutter filled to overflowing all the water that could go between these two pieces ran down the inside of the wall. Once found, a solution was comparatively simple. But all this could have been prevented had adequate thought been given to the detail and to the tinsmith's private shortcuts.

Gutters are generally made of hard copper. The superintendent should see that they are properly fastened or supported. They should be well pitched and be strong enough to come through the winter without bellies or sags. Of course, if copper is used the superintendent will see to it that no other metal comes into contact with it, and that any nails used to fasten it are of copper, brass, or bronze. The superintendent should see that a suitable copper basket is furnished to be placed over the leaders to prevent leaves from going down the pipes. Leaders must be well supported and be of adequate size to carry off all the water the gutters convey to them. There should be as few bends as possible in leaders. If possible they should not be left unprotected at their base when placed along the edge of driveways or in other locations where they may be dented or injured by automobiles. The bottom piece or shoe—generally put on when the leader does not discharge into a sewer line or cesspool—should never be mitered at right-angles or merely soldered on with the expectation that it will hold fast. If possible the shoe and leader should be of one piece.

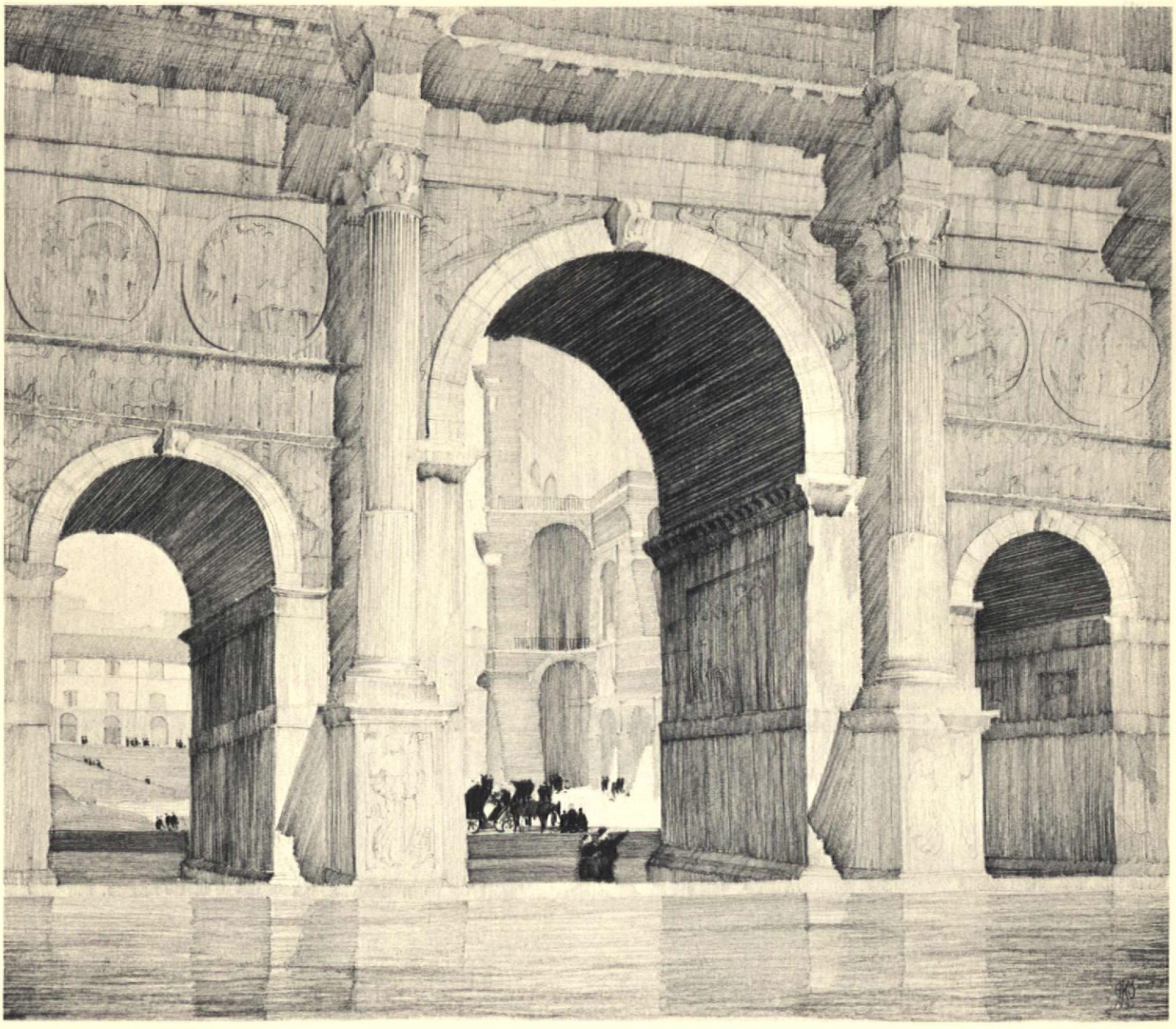
## MECHANICAL APPURTENANCES

What might be termed the mechanical appliances of a building are too often left to the prejudiced judgment of those interested in furnishing them, to the imagination of a so-called mechanical expert, or in the lap of the gods. Yet usually these appliances are vital factors in the maintenance of the building and if not properly chosen will figure all too prominently later in the "cost of operation" account. As buildings become more and more mechanized it is of paramount importance that the architect thoroughly familiarize himself with the mechanical details of his building.

Tanks, which may be for house, fire, or suction purposes, should most certainly be well investigated. The relatively small wooden tank formerly seen on the top of the five or six story flat has now grown into an enormous container, resting on the top of a sixteen or twenty story apartment dwelling, and is now usually concealed by a design artifice of one sort or another. Generally these wooden tanks are of pine or cypress. The wood should be dry and the abutting edge of each plank properly bevelled. It is well to be sure that the heartwood is on the inside of the tank. The round hoops securing the sides should be of wrought iron, with their connections staggered. Inasmuch as the wood will swell when wet, the hoops are not pulled up tight when the tank is first erected. However, the superintendent should see to it that they have been properly adjusted before he certifies to the final completion of the work.

When steel tanks are placed on the interior of fireproof buildings the slab beneath them will sometimes be poured before the dunnage beams are set (the beams actually carrying the tank). This sometimes leads to error in setting the dunnage beams, which should be placed exactly as called for on the plan, and no risk taken which might cause the load to rest where supports are not sufficient to carry it. The superintendent should insist that the drainage pan called for is provided, because failure to do so will cause a wet or damp floor when the tank sweats. A waterproofed floor may be substituted for the pan.

*(To be continued)*



ARCH OF CONSTANTINE

*From the drawing in pencil by Burton Kenneth Johnstone,*
1932 Fellow, The American Academy in Rome



MARKET SQUARE, NUREMBURG
*From the drawing in pencil by Burton Kenneth Johnstone,*
1932 Fellow, The American Academy in Rome

# The Architectural Observer

IT has frequently been said that an architect does his best work when his cost restrictions prevent his using anything and everything he would like in the way of materials. We do not know that such restrictions are responsible for this frank use of scored hollow-tile blocks in a penthouse on the Mission Inn at River-

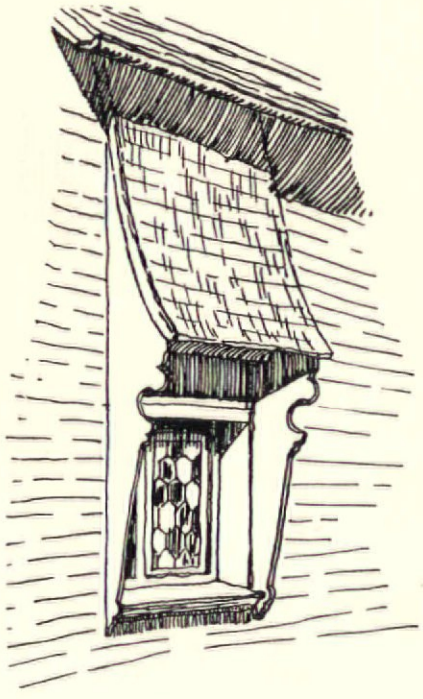


side, Calif. Perhaps the architect, G. Stanley Wilson, used it because he liked the effect of the color with his tile roof. In any event he employed the same pattern, uncovered, inside as well as out.

THAT necessary evil, the picture moulding, has been moved from below a frieze space up to the ceiling, and sometimes back again. Here is an ingenious scheme as developed by J. Prölsdörfer, Karlsruhe, and illustrated in the *Deutsche Bauzeitung*, which is in effect a very small slot in the plaster. It is fastened on the studding and serves as a ground for the plaster. The usual hooks will fit it.

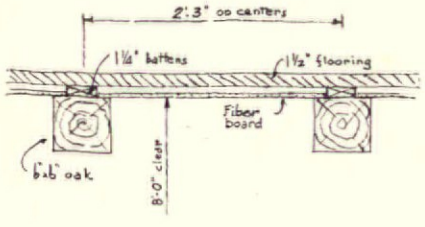


THE meticulous housekeeper, as an architect's client, sometimes objects to the use of steel casement windows on the grounds that a sudden rain storm is likely to damage



her hangings. Possibly the only way to prevent such damage is by some sort of hood over the outside, unless the windows happen to be close enough to the overhanging eaves to be protected by their projecting soffit. Here, however, is an idea that might serve for adaptation. It is a detail from the Swiss chalet as reproduced by a contributor to *The Architects' Journal* of London.

HERE is a simple solution of the problem occasionally incurred in domestic architectural practice where one wants to show the structural beams in a ceiling. It is, of course, a modification of the familiar mill construction, using an inch and a half floor, splined. This variation was developed by L. A. Culliford, an architect of Beckenham, England.




THE designer of interior details who would find some way out of the difficulty of hanging heavy wraps merely by a tape on a hook, is usually driven to the coat-hanger on a pole. Here, however, in a villa at Canavese, Italy, a coat rack has been built in by Pagano-Pogatschnig & Levi-Montalcini, which avoids the



hanging of a coat by its tape through the use of the metal ring. Incidentally, the umbrella rack, it will be noticed, provides a small receptacle for the drip.

PRIVACY for sun bathing is encountered by the architect as a problem more and more frequently. Hans Zimmerman, an architect of Stuttgart, publishes in *Bauzeitung* his utilization of a flat-roofed extension to a house in a rather crowded suburban community. He gains privacy by vertical awning curtains fastened to rings, so that they may be pulled to any desired place in the perimeter.



# Selling Architectural Services Today

## *By Rion Bercovici*

*There are architects today who sit in their offices, like the doctor who has just hung out his first shingle, awaiting with more or less patience the client, who, unless through some miracle, is unlikely to appear. There are others who go out to seek the client, holding it to be no breach of professional ethics if one can show a man that it is in his own interest to undertake some kind of building—and such a demonstration is not particularly difficult even in these times. Here is the picture of such possibilities as drawn by our investigator, in the realm of stores and restaurants.*—EDITOR.

IN order to sell his services today the architect must be able to talk to business men in their language. He must present his case from the angle of his ability to do work that will sell—merchandise, services, floor space, and anything that is housed. The architect cannot just be a merchant of even the most expert *architectural and building counsel:* he must be a merchant of *auxiliaries to salesmanship* in one form or another.

To do this successfully he must adjust himself to the rhythm of the times. Through intelligent analysis and utilization, the depression, instead of serving as the ultimate sales refusal of a prospective client, may be the most potent sales argument in favor of the architect.

This adjustment requires a new philosophy of the architect's service, and in some cases a completely new orientation in his own mind concerning his function. This adjustment, however, can be made, and must be made. Otherwise, the architect is in danger of finding himself belonging to a profession that is suffering, perhaps above all others, from attrition due to dearth of nourishment from the formerly regular and normal flow of new business.

With nourishment failing in these erstwhile green, but now arid, pastures, the architect must look for salvation, and even survival itself, to new fields, and must be able to adapt himself to changed conditions. If he attempts to survive purely as a recluse architect, he is doomed. His opportunity lies in filling the rôle of one of the few indispensable counsellors to various phases of an ailing business structure. He must, in many cases, drop the rôle of specialist and be content to carry on as a general practitioner. Colorless as this part may be, in comparison to more creative work, it is one that may be built into a substantial source of business. Recognition of this new development, and his place in the changed business structure, is the architect's life-line today.

A highly paid medical specialist may not be eager to assume the practice of a general practitioner, but it may often be today his only opportunity to carry on his profession. Through this field, besides surviving economically, he keeps himself in touch with his art, and accumulates a fund of invaluable experience, perhaps developing new specialties. This parallel holds true for the architect.

It is made dramatically clear in opportunities often unnoticed by the architect. In the specific cases of restaurants, delicatessen shops, and smaller retail establishments, the architect has an opportunity to synchronize his work with the needs of business. Competition in this field is sharp, and trade depends to a very great extent upon appearances of the establishment and effective presentation of merchandise.

A restaurant, for example, is more than a retailer of cooked foods combined in various ways. It is selling an atmosphere of quiet, rest, or even diversion, in keeping with its policy and the class of customers to which it caters. In this respect there is a good opportunity for the architect. He may discover a real need for his services, and he can point out this need intelligently to restaurant operators, and to realty men and property owners in whose structures there are unrented restaurants or floor space available for such use.

Until quite recently the cafeterias and the cheaper eating places, especially in the East, made very little effort to present an attractive appearance to the customer. Relying on price appeal, they did not think any inducements beyond that, and cleanliness, were necessary. Keener competition, however, and economic changes, have altered this policy. For example, the "new poor" and the white-collar class, who formerly ate in more expensive restaurants, are compelled to eat in cafeterias and the cheaper eating places because of their reduced incomes. An intense effort to obtain the regular patronage of this class is being made today. There are numerous instances. Some of the chain cafeterias in New York City are as different as possi-

ble from the noisy, clattering cafeteria of yesterday. With individual tables, attractive lighting, and modern display of food, they attract many customers. Certain new cafeterias utilize the modern note in their restaurants; others have followed the policy of creating national atmospheres to lend romance to the prosaic business of eating.

Often, expert inspection and analysis by an architect can aid the restaurant owner at a very small cost. An interesting example has recently been furnished by the Broadmoor Restaurant in New York. Ely Jacques Kahn, architect, noticed how noisy the place was. Advising the owner, acoustic treatment was given to the ceiling at a cost of about five hundred dollars, a minor alteration that added considerably to the value of the restaurant, giving it added appeal in a highly competitive neighborhood.

This sort of assistance can be rendered by wide-awake architects noticing circumstances deleterious to business that may be overcome by low-priced methods and devices.

Mr. Kahn is keen on the value of business knowledge to the architect, and pointed out that James B. Newman, of his firm, is giving Princeton University architecture students a course in the underlying business principles of the profession. Mr. Kahn also believes that there is a potential and currently neglected field for architects in industrial designing of fabrics, metals, and so forth. He advocates the establishment of educational facilities in these arts.

"The architect should be enabled to analyze the entire status of a project," said Mr. Kahn, "in such a way that he can talk intelligently to builders, real-estate people, financiers, and merchants.

"The architect should know his own exact position in the general business structure. He should be familiar with all the elements that enter into building, from financial set-up and promotion to leasing and utilization of floor space in a profitable manner. He should keep informed and be on the 'inside' of building activities. He should know in advance when his services may be needed. If this is unethical, every businesslike architect is unethical."

Mr. Kahn pointed out another architectural opportunity in the possibility of modernizing the many empty theatres throughout the country, and making them more easily rentable.

Roswell Barratt, New York architect, noticed that the grocery department of Fortnum & Mason, exclusive English specialty shop on Madison Avenue, was so lighted that attention, instead of being concentrated on the groceries for sale, was attracted to the British coat-of-arms and the glaring ceiling.

Through the simple expedient of advising the installation of a modern reflector, the intensity of the illumination on the merchandise was increased to such an extent that attention and sales were spurred considerably. The physical cost of this installation was about one hundred dollars. Its value to the store was many times that amount.

Mr. Barratt is enthusiastic about the possibility of architects creating a new class of work on a consultant basis.





*A corner of the Fortnum & Mason store before and after an architect had called their attention to the possibility of selling more goods through better lighting*

*Photographs by Werner Associates*

"Drawings often scare off a prospective client," he said. "Somehow, they are associated in his mind with money and complexity. If you can do work without drawings, you have a distinct advantage today.

"I am a great believer in architects cashing in as much as possible on their experience. There are many consulting jobs waiting for the wise architect who realizes the necessity for this kind of service. Co-operation with engineers, owners, and builders is an important factor in this type of work."

Mr. Barratt believes that there is much work available in the inspection of new and renovated buildings and the giving of miscellaneous advice, even down to the suggestion of appropriate paint.

"I have had the good fortune recently," he said, "to obtain a lucrative commission because I good-naturedly gave one man advice about painting his house, when I had every right to refuse such advice, as he had turned over a job on which I had been working to another architect. He wanted me to give him counsel that would prevent his wife from ruining their house with an inappropriate paint. I gave him this advice. Not long afterward, the country club of whose house committee this man was chairman, burned down. The job for the new building came to me.

"Widespread consulting work does more than bring in money to the architect. It builds a circle of friends and contacts that may prove extremely valuable in a business way as a foundation for future work."

In this respect it is interesting to note the similarity of Mr. Barratt's consultant services with the practice obtaining in England and France, where architects act as continual counsellors to their clients, long after a building has been erected. The lack of new work on a scale comparable to our own makes this an important feature of the architect's activities. Similar conditions in this country are apparently creating similar results.

"I find it convenient to charge for many of these jobs on an hourly basis," said Mr. Barratt, "and have little difficulty in getting my money. Contact with lawyers and doctors has mentally prepared the business man for payment on a fee basis for expert advice. As a matter of fact, I don't see why experienced architects cannot let it be known they are a sort of informal counsel and research bureau, acting for the building owner, or lessor. In this way they may perform a service of great value to the community, while building a profitable niche for themselves."

The work done by Mr. Barratt for Fortnum & Mason is an example of the proper way of selling the kind of architectural service that is of direct benefit to a business. Fortnum & Mason were sold on the idea because they realized that it would aid in selling their goods. The architect analyzed the lighting situation from the standpoint of the service rendered by the store, *i. e.*, the selling of groceries. Through his technically superior knowledge of what could be done in a given situation, plus his observation of the store's needs, he knew how it was possible to present the merchandise in a better manner to the customer. That combination of knowledge was bought by the store. If he had approached Fortnum & Mason from the standpoint of architectural design, fitness or beauty, the reply would probably have been, "We can't spend money for anything like that today." This cannot be the reply when the store is shown how it may sell more merchandise. The architect has geared his services into the functional workings of a business organization. That is the main line of thought he must keep in mind in obtaining this kind of work.

The architect should also keep in mind current social and business conditions, and their relation to possible purchasers of his services. There are other factors in the offing that must be considered by the wide-awake architect. The legalized selling of beer and wine will naturally tend to the building of new types of restaurants, as well as the modification of existing establishments. Those institutions remodelling themselves on the pattern of German beer halls, wine halls, Parisian cafés, etc., will have the edge on their more sedate competitors.

In a word, the architect might well constitute himself a seller of business presentation. He should sell architectural service and its results, not only as something convenient and appropriate, but as a permanent and valuable aid to the store and its functions.

Effective presentation is as important to business today as a clean collar to a business man. Even if his business is not as profitable as yesterday, the business man wears a clean collar or he is utterly hopeless. Without it, he loses not only his standing among men but his own morale as well. Business needs the clean collar today more than ever before, and the architect can supply this need.

THE SEVENTY-EIGHTH IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

# ARCHITECTURE'S PORTFOLIO OF

# VERANDAS

*Subjects of previous portfolios are listed below at left and right of page*



1926
- DORMER WINDOWS
- SHUTTERS AND BLINDS

1927
- ENGLISH PANELLING
- GEORGIAN STAIRWAYS
- STONE MASONRY TEXTURES
- ENGLISH CHIMNEYS
- FANLIGHTS AND OVERDOORS
- TEXTURES OF BRICKWORK
- IRON RAILINGS
- DOOR HARDWARE
- PALLADIAN MOTIVES
- GABLE ENDS
- COLONIAL TOP-RAILINGS
- CIRCULAR AND OVAL WINDOWS

1928
- BUILT-IN BOOKCASES
- CHIMNEY TOPS
- DOOR HOODS
- BAY WINDOWS
- CUPOLAS
- GARDEN GATES
- STAIR ENDS
- BALCONIES
- GARDEN WALLS
- ARCADES
- PLASTER CEILINGS
- CORNICES OF WOOD

1929
- DOORWAY LIGHTING
- ENGLISH FIREPLACES
- GATE-POST TOPS
- GARDEN STEPS
- RAIN LEADER HEADS
- GARDEN POOLS
- QUOINS
- INTERIOR PAVING
- BELT COURSES
- KEYSTONES
- AIDS TO FENESTRATION
- BALUSTRADES

*Below are the subjects of forthcoming Portfolios*

The Eagle in Sculpture
MAY

Eaves Returns on Masonry Gables
JUNE

Exterior Lettering
JULY

Entrance Driveways
AUGUST

Corbels
SEPTEMBER

Pew Ends
OCTOBER

*Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up about six weeks in advance of publication date.*

1930
- SPANDRELS
- CHANCEL FURNITURE
- BUSINESS BUILDING ENTRANCES
- GARDEN SHELTERS
- ELEVATOR DOORS
- ENTRANCE PORCHES
- PATIOS
- TREILLAGE
- FLAGPOLE HOLDERS
- CASEMENT WINDOWS
- FENCES OF WOOD
- GOTHIC DOORWAYS

1931
- BANKING-ROOM CHECK DESKS
- SECOND-STORY PORCHES
- TOWER CLOCKS
- ALTARS
- GARAGE DOORS
- MAIL-CHUTE BOXES
- WEATHER-VANES
- BANK ENTRANCES
- URNS
- WINDOW GRILLES
- CHINA CUPBOARDS
- PARAPETS

1932
- RADIATOR ENCLOSURES
- INTERIOR CLOCKS
- OUTSIDE STAIRWAYS
- LEADED GLASS MEDALLIONS
- EXTERIOR DOORS OF WOOD
- METAL FENCES
- HANGING SIGNS
- WOOD CEILINGS
- MARQUISES
- WALL SHEATHING
- FRENCH STONEWORK
- OVER-MANTEL TREATMENTS

1933
- BANK SCREENS
- INTERIOR DOORS
- METAL STAIR RAILINGS



*E. T. Hapgood*

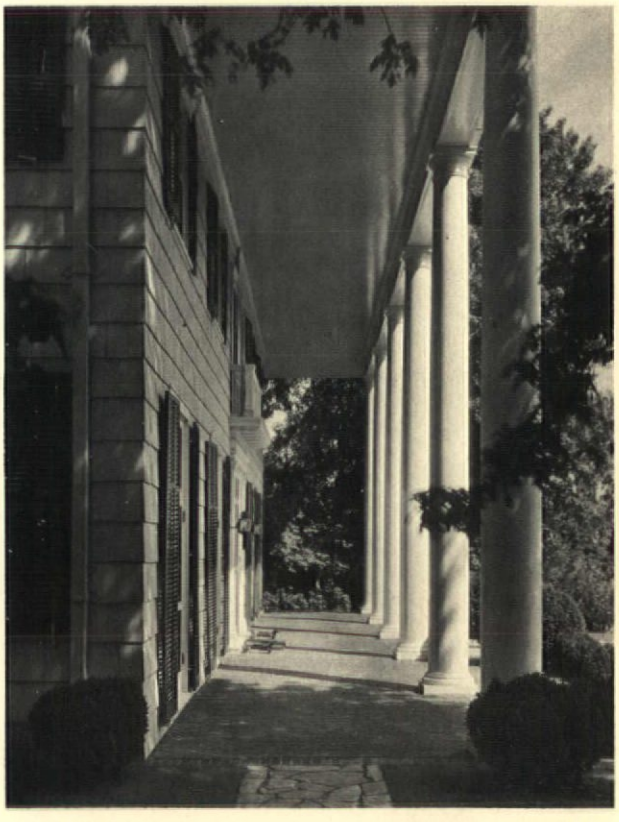


*Electus D. Litchfield*

*Charles H. Higgins*



*The Office of John Russell Pope*





*Adams & Adams*



*Philip L. Small & Associates*

*Robert Wiseman*



*Aymar Embury II*





*Van Cortlandt Manor House, New York City*



*Guy Lowell*



*Walter John Skinner*

*Edward Buehler Delk*





*Hentz, Reid & Adler*



*McKim, Mead & White*



*Bradley Delehanty*



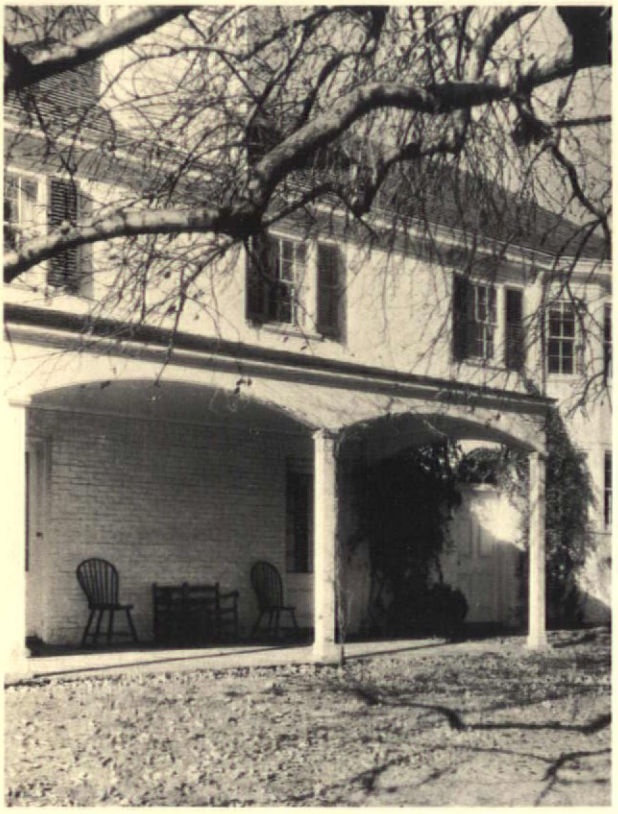
*John M. Bell*

*Sir John Soane*



*Roland E. Coate*





*Evans, Moore & Woodbridge*



*Leigh French, Jr.*

*Huszagh & Hill*



*Edmund B. Gilchrist*





*Delano & Aldrich*



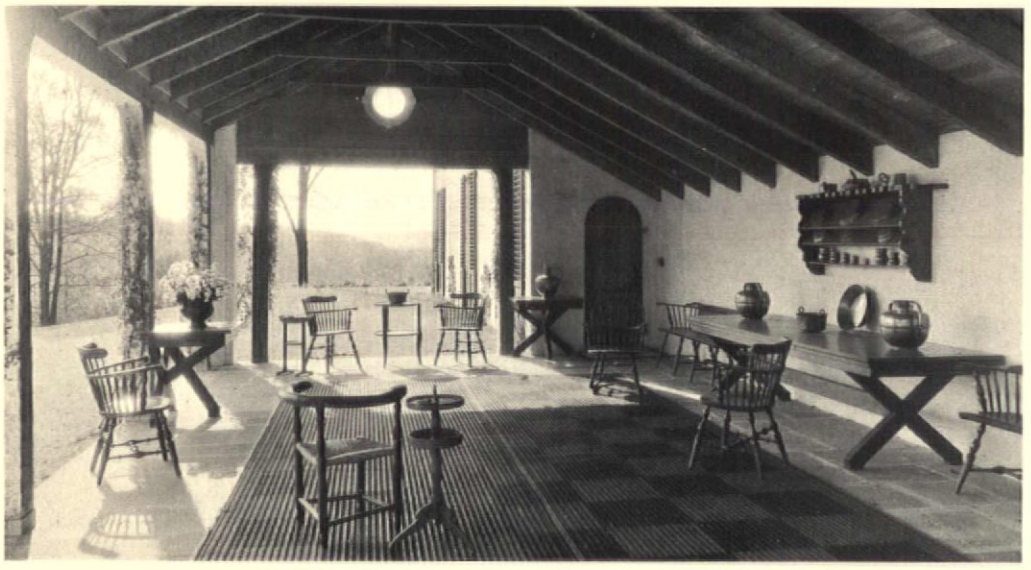
*Alfred Heideman*



*Wesley S. Bessell*

*Edward S. Paxson*

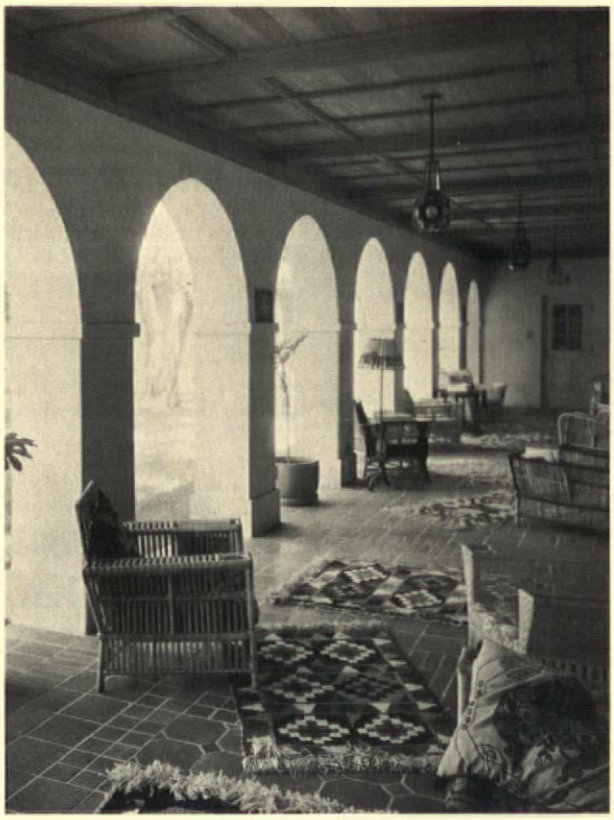




*Bradley Delehanty*



*B. F. Chapman and H. M. Woolsey*

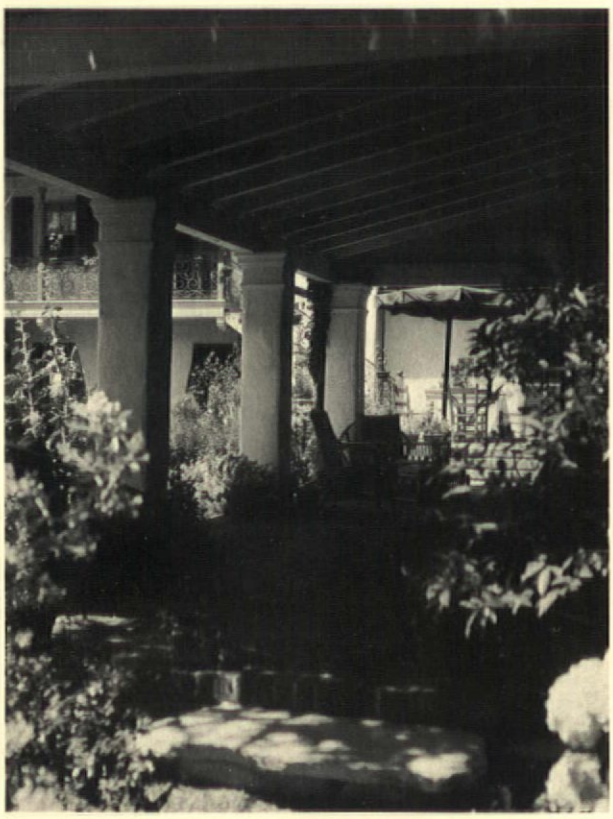


*Weston & Weston*



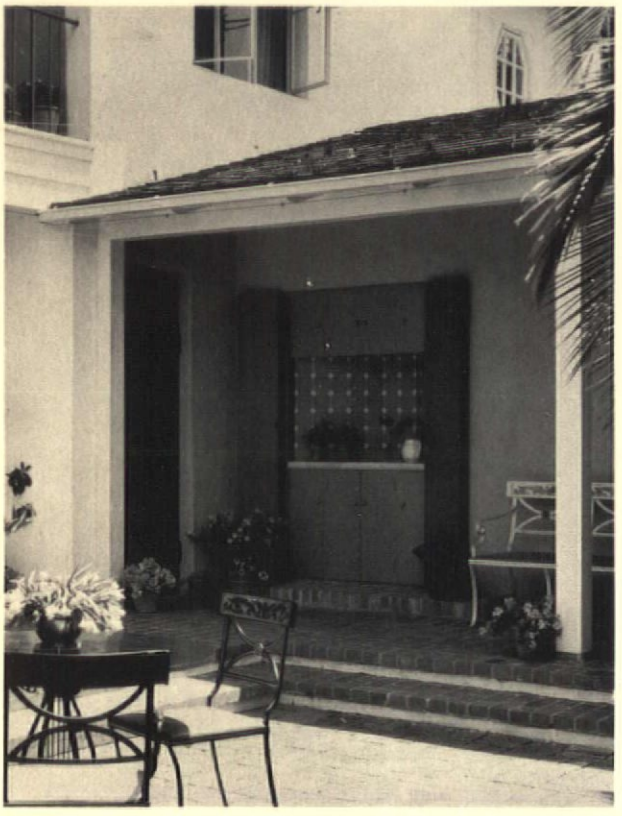
*Roland E. Coate*

*Roland E. Coate*



*R. H. Heath*





*Roland E. Coate*

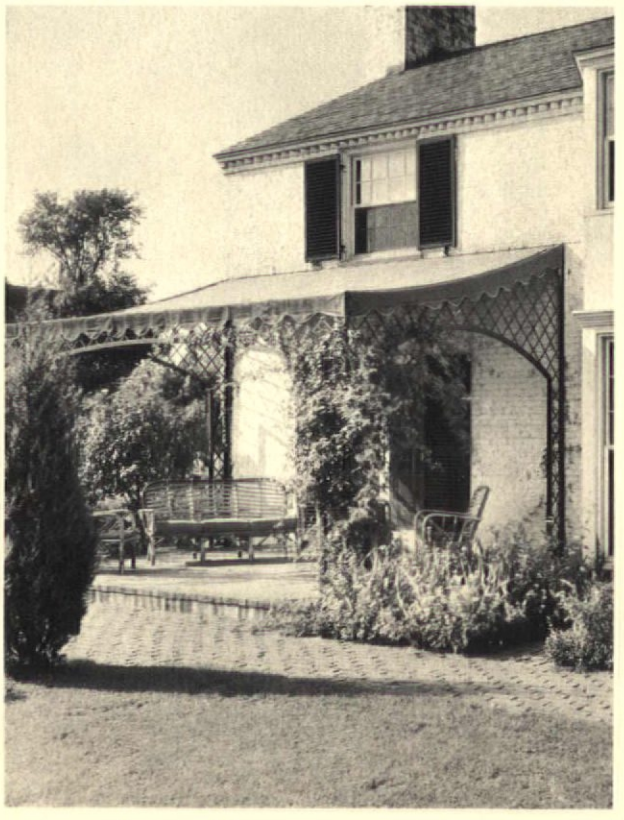


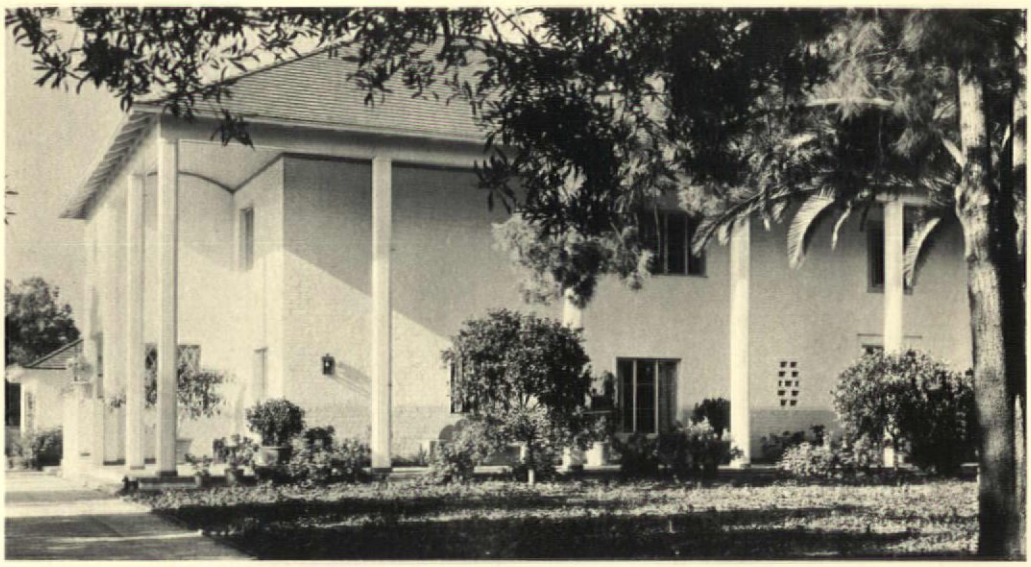
*Kilham, Hopkins & Greeley*

*Wallace Neff*

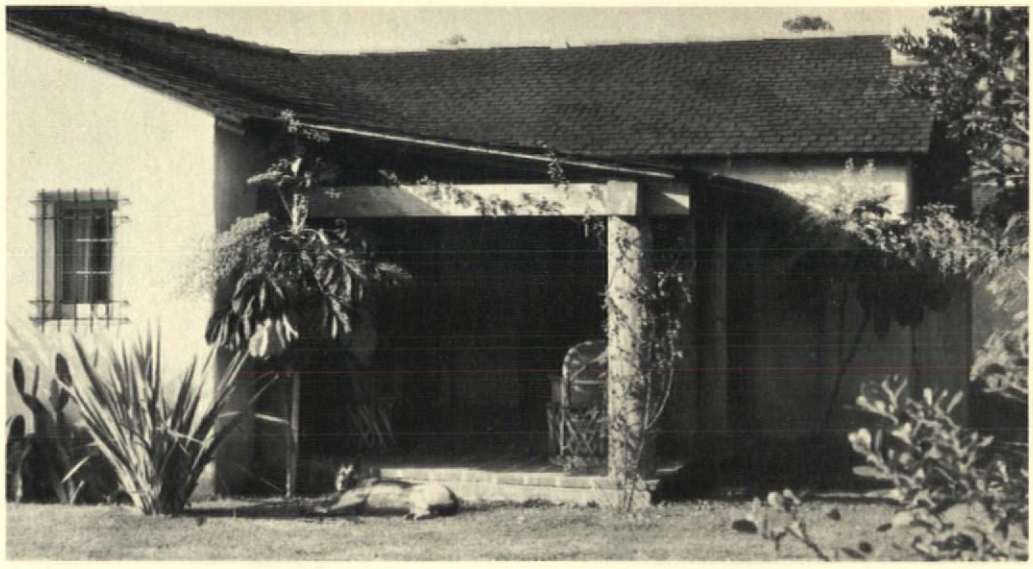


*Godwin, Thompson & Patterson*





*Roland E. Coate*

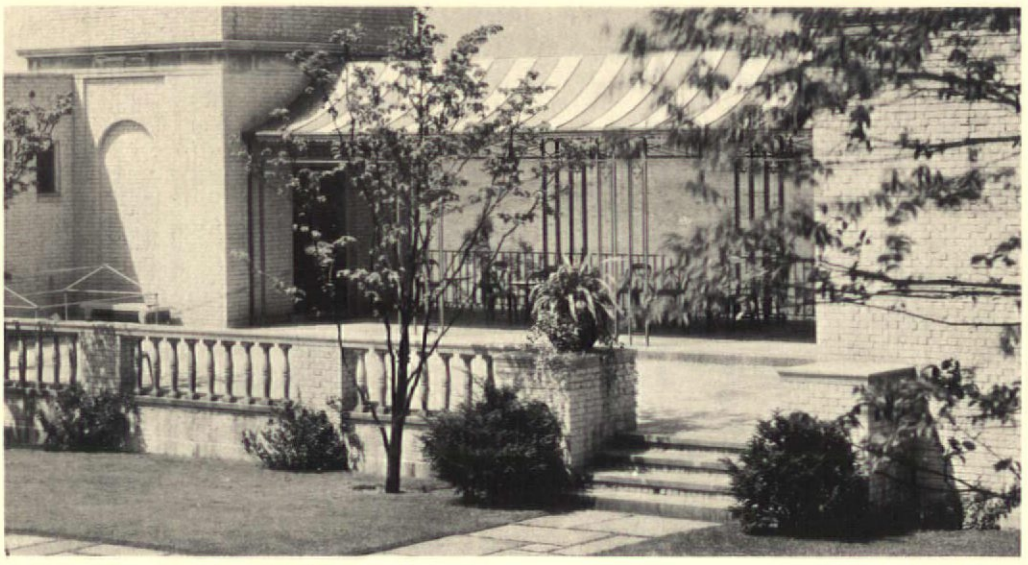


*Donald D. McMurray*



*G. W. Harris; Mary Jane Colter*

*William Pitkin, Jr., & Seward H. Mott*





*Leigh French, Jr.; H. D. Eberlein*



*Frederick Kennedy*

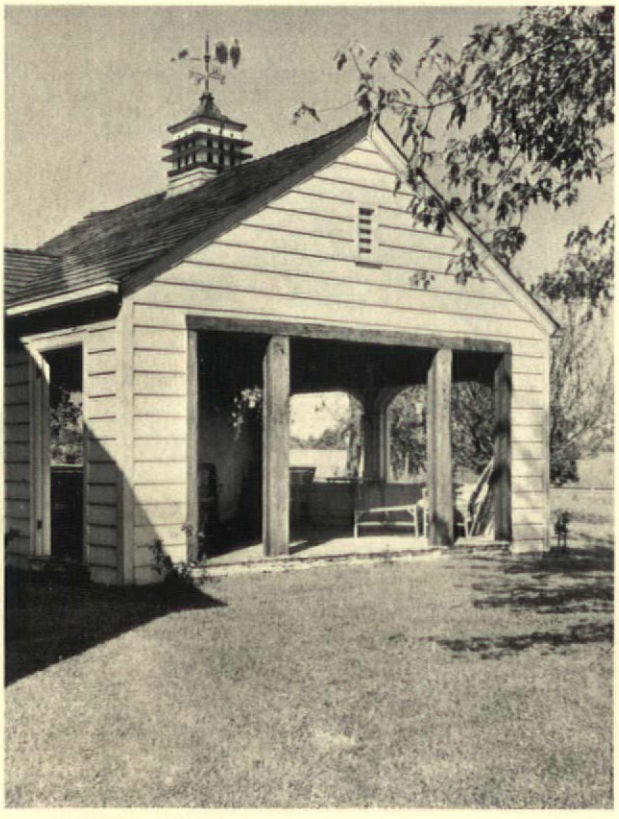


*The Office of John Russell Pope*



*Typical old New Orleans*

*J. Larkin Baldridge*



*Frank J. Forster, R. A. Gallimore*



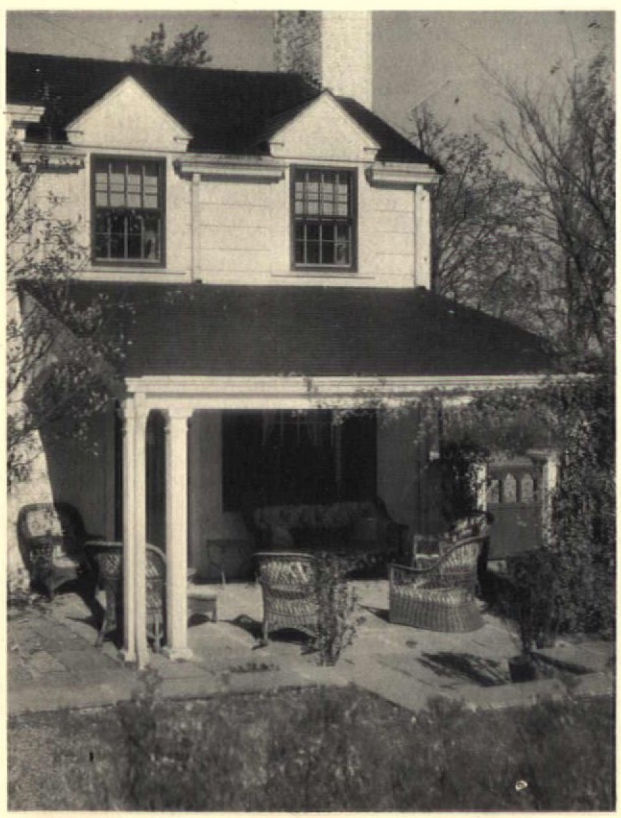


*Henry Hopkins*



*F. Burrall Hoffman, Jr.*

*Evans, Moore & Woodbridge*



*Polhemus & Coffin*





*Wallace & Warner*



*J. Larkin Baldridge*



*G. B. Rogers*

# ARCHITECTURE

VOLUME LXVII MAY 1933 NUMBER 5

# The Way Out

## *By Marshal L. Oliver*

*A satisfactory solution of the problem of providing employment through a well-conceived plan for work relief must be grounded not only on technical knowledge but also on an understanding of the basic social and economic principles which it implies.*

ARCHITECTURE *therefore proposes, in a series of forthcoming articles, to present a complete discussion of the question from its logical beginnings. It is sincerely hoped that the readers of these articles will thus be equipped and persuaded to carry on a vigorous and victorious campaign to obtain for this country the relief of which she so desperately stands in need.*—EDITOR.

"The idea that a public-works programme represents a desperate risk to cure a moderate evil is the reverse of truth. It is a negligible risk to cure a monstrous anomaly."

—*John Meynard Keynes, London, 1921.*

THE most urgent problem of the present crisis is to provide the means of immediate unemployment relief. Since local and even State authorities are no longer able to cope with the emergency, this has finally become one of the major responsibilities of the Federal Government. All that remains to be decided is whether the authorities will seek to bring about a recovery of business by undertaking a courageously conceived programme of public works or whether, at last, we must resort to the dole.

The fact has been repeatedly brought out that the underlying cause of economic depression is a failure of buying power. Whereas in the past it was generally believed that a surplus of labor could be absorbed only by the gradual, automatic resumption of industrial activity, recent events have forced the conclusion that the shoe is on the other foot. Economists now unite in proclaiming that until buying power has been restored by creating employment for labor there can be no general recovery of trade.

No industry in the country provides a wider or more highly diversified market than does building. At the same time there is no more constant, unsatisfied demand than that for public and semi-public improvements: slum clearance, model housing, better facilities for education, recreation, and the public health.

If, as is undeniable, these needs can now be satisfied with the maximum of economy and in such a way as to provide work for a vast number of men who must otherwise be degraded by charity, it is unthinkable that we should hesitate longer before initiating immediate, intelligent action to bring about an extensive programme of Government-financed public works.

Responsibility for the development of such a programme must rest ultimately with our architects and engineers. Since this is so it seems essential that members of these professions should unite to carry on the educational work which is necessary before it can be brought about.

Here, then, are the essential principles involved, expressed for the most part in the words of experts who have studied the matter in whole and in some of its many ramifications. The quotations which follow have been chosen, from a mass of equally relevant material, with the idea of boiling the subject down to its essentials and answering the chief questions which arise.

The statements immediately following were extracted from hearings before a sub-committee of the United States Senate Committee on Banking and Currency, which met in Washington last February to consider further unemployment relief through the Reconstruction Finance Corporation.

In this country we have a surplus man power now, and consequently any co-operative effort on the part of the Federal Government that will encourage the building of en-

during edifices and public works that are of benefit to society as a whole, socially, esthetically, or from the standpoint of education or public health, in my opinion, is a very wise measure.

CARL B. FRITSCHE, M. E., member of the Committee on Aeronautics of the American Society of Mechanical Engineers, Detroit, Mich.

A public-works programme is necessary to start us out of the slump. It is not the only thing. It will not do it alone. But all other reasonable measures would be assisted by it. For instance, if you want to increase commodity prices, public works increases commodity prices by creating a demand for a large number of construction materials. The worker does not buy concrete. He buys shirts and consumer's goods. Therefore, we create a demand for all of those things. And as some one has said, it merely "primes the pump."

OTTO T. MALLERY, economist specializing in unemployment and public works, Philadelphia, Pa.

At the end of the World War our Federal public debt was in the neighborhood of $25,000,000,000 and nobody worried about the solvency of this country. Nobody questioned but that it was sound.

Today our public debt is $20,000,000,000, in round numbers.

Suppose it does take a $5,000,000,000 programme to get this economic engine off dead centre. What of it? Certainly in actual wealth and in potential wealth this country is a far better risk than it was in 1918.

CARL B. FRITSCHE.

There seems to be quite a general misconception that since there are ten or twelve million people out of work the Federal Government of course cannot provide jobs for all of those people on public works, so why bother with it at all? The idea is entirely overlooked that construction of public works and the stimulation of public works generally is only one of several means, and it occurs to our minds, perhaps, that it is assisting to prime the pump of recovery, to get business here and to get business there, and to give some jobs in that manner so that we may get back to a position where trade and industry can reemploy these people, as it is only from revived trade and industry that the ten or twelve million people are ever going to get genuine and permament employment.

MARTIN DODGE, representing the Banking and Industrial Committee of the Second Federal Reserve District.

Engineering studies have gone into this matter very carefully and have indicated that for all public-works construction directly and indirectly about 80 per cent of the cost of the project goes to the laborer, goes to wages and salaries.

And that is distributed over a large area. It offers one of the sound methods of helping unemployed men as well as stimulating business.

MARTIN DODGE.

A bond of obligation issued for the purpose of raising money to be distributed in a dole represents no value. A bond, however, issued for public works represents a needful and economically sound addition to community facilities and the benefits derived therefrom will, in more prosperous times, permit the retirement of the obligation.

To illustrate the economy of unemployment relief by public works rather than by taxation to pay a dole, assume a public-works construction programme amounting to $3,000,000,000. This involves a charge for interest and amortization of about $150,000,000 a year. It is estimated that such a programme would give employment to between 1,500,000 and 2,000,000 workers per year, distributed between the construction work and the many industries that serve construction. To support these same workers in idleness would cost the community between $750,000,000 and a billion dollars a year, as compared to interest charges of $150,000,000 on a public-works programme.

Money expended in doles or direct relief contributes little to the stimulation of trade, whereas money spent in public works stimulates business not only in the community itself but throughout the material and transportation industries. If the money for a dole is to come out of taxes, as it properly should, since it is ruinous to borrow money to give away, the present burden on the taxpayer would be actually relieved through a public-works programme because the taxpayer will only have to bear the interest charge on the moneys expended. If the Government and its subdivisions must borrow to effect economic relief, it will be far better to invest the funds so raised in community facilities, thereby conserving the public wealth and stimulating a normal resumption of trade.

It is recognized that the word "tax" has come to be a bugaboo to the American public, but it need not be so, if properly administered. As the funds for relief must necessarily come from public sources we have no other alternative than to resort to taxation and we maintain that it is far better to tax for improvement which will raise the standards of living within the community and increase property values

because of an added convenience, than to tax and apportion out these same funds without the production of this asset.

JOHN P. HOGAN, Consulting Engineer, New York City; chairman of the Public Works Committee of the American Society of Civil Engineers.

The balancing of budgets so far as current operations are concerned is desirable and necessary; but it is not necessary to include in such balancing the principal sums invested in useful community facilities. Competent economic opinion has almost universally held that it is wise governmental finance to borrow for public works in periods of depression and to repay out of taxes levied upon the future surplus earnings of prosperity. Public works built at present low wages and price levels and financed at reasonable rates of interest will carry a very low cost and require a relatively lower debt-service charge in the tax rate over years to come. It is good business as well as good tactics to use this opportunity to add substantially to the public wealth.

JOHN P. HOGAN.

At this time this is the only way out. Those who still have private means need such encouragement before they will invest their capital in productive enterprise. When the Government borrows money, all it does is to mobilize timid private capital and make it available under public auspices.

SENATOR WAGNER. It is a stimulation to private industry, after all?

MR. FRITSCHE. In the long run, it is, unquestionably, and this is the true way to promote dependable prosperity.

CARL B. FRITSCHE.

In his statement, Mr. Robert D. Kohn, Chairman of the Construction League of the United States and past President of the A. I. A., made the following remarks about slum clearance and housing which he recommends as being especially suitable forms of public work:

Sir Raymond Unwin, speaking to a parliamentary commission in London about housing, said: "Gentlemen, every £100 that you spend on slum clearance is £100 less paid out in the dole." Every $1 we put into a thing like cleaning up a city is $1 less spent on direct charities, and we are actually improving the tax income of the city by that because in New York, although they have given tax exemption on the improvement in this housing on the buildings themselves, the land value has been so increased by reason of these improvements, the better housing, that the land now returns to the city in every case a larger tax than both the land and the old buildings on the land returned to the city before the housing was built.

The chairman of the Federal Reserve Board, Mr. Meyer, said to the Real Estate Board in New York, that they should not oppose the housing. "You cannot possibly be injured by the competition of these new cheap apartments, no matter how many are built. As a matter of fact you will not be injured as much as you will be injured if you do not give work to people who are out of work." Property values are going to be more injured from the lack of work for workmen than they can possibly be injured by the competition of the new buildings that might be built up.

Those members of the Federal Government now engaged in formulating a plan for work relief are comparing the respective merits of many projects, highly diverse in character and purpose which have been submitted for their approval.

It is, of course, desirable that the benefits of public work be as widely spread as possible. To this end we must support such undertakings as the scheme for reforestation, the construction of needed bridges and tunnels and the extension of facilities for water supply, electrification, and sewage disposal.

The architect in approaching the subject must naturally consider the possibilities of essential building construction. No vital problem has more persistently escaped solution than has slum elimination combined with some means of providing suitable habitations for families in the low-wage-earning group.

We must profoundly believe that the combination of our present circumstances (*i.e.*, unemployment and industrial stagnation, which can be alleviated only through provision by the Government of funds for the creation of work on public improvements) plus the liberalization of public opinion which has grown out of the unavoidable facing of facts during three long years, have removed the solution of housing problems from the realm of the impossible. Believing further that its solution is a primary duty of the architectural profession, we urge on all its members the necessity for informing themselves on this subject.

Under their leadership it can reasonably be hoped that a proportion of the money allotted by the Government to the provision of useful employment may be utilized as well to accomplish a second, equally desirable result: to improve the unhealthful, uneconomic, unsocial surroundings in which such a large majority of our population are now condemned to dwell.

Numerous questions arise whenever the words "public works," "slum clearance," or "housing projects" are introduced into conversation. On the following pages it has been our intention to phrase for the reader some of the questions which most often recur in this connection. They make no pretense of exhausting the subject or of going much below the surface of the matter under consideration. It is our desire, rather, to indicate what form such queries usually take and by answering them authoritatively to show how much ground has already been gained in what we conceive to be the right direction.

Mr. David Cushman Coyle, to whom we submitted one list of questions on the economic implications, is a consulting engineer who has devoted much time to the consideration of modern economic problems. He has made notable contributions to the subject, both in writing and speaking before many organizations. He was among those invited to present their views before the Senate sub-committee above mentioned.

*Can the Federal Government, by appropriating funds with which to finance extensive necessary building construction projects, materially improve our present economic condition?*

Yes, provided work is undertaken on a sufficiently large scale. Private capital investment is no longer an adequate source of consumer buying power. To the extent that the Government can put men who are now unemployed to work on useful projects it can replace private investment as a source of buying power, thus bringing about a resumption of business activity, without creating dangerous quantities of new commercial debt.

*Under existing circumstances can the Government "afford" to embark on such an undertaking?*

So long as action on an adequate scale is postponed, the depression continues to deepen and the Federal revenues to dry up. The Federal deficit can be wiped out only by increasing expenditures enough to end the depression.

*In what manner can the Government obtain the funds with which to carry out a public-works programme?*

The public must be aroused to the need for immediate action, in order to permit the sale of Government bonds. It will be necessary at the same time to expand currency or bank credit, and the Federal Government must hold absolute authority to force banking co-operation.

*What general requirements must be fulfilled by work projects before they may be expected to accomplish the desired result?*

They must be obviously useful and carried out in an efficient and workmanlike manner, so as to maintain public support for an adequate volume of expenditure. They should not be of such a nature as to duplicate the undertakings of private enterprise.

*Must all Government work projects be financially self-liquidating?*

On the contrary, a self-liquidating project is a burden on the consumer buying market, the same as a commercial plant. Only non-self-liquidating works are of permanent value in creating sound business conditions.

*Is it desirable for the Government to do its building during depressed periods rather than in times of normal business activity?*

Business stability requires high and increasing public expenditure. The rate of increase should be greater during depressed periods, but any tendency to reduce public spending during prosperity will tend to bring on depression. A constantly rising rate of public spending is the necessary adjustment to rising technological productivity.

*Do projects involving the clearance of slums and the erection of model housing meet the above specified requirements of economically sound work relief?*

The social advantages of better housing are sufficient to justify it. So far as its effects on permanent prosperity are concerned, the essential factors are these: Enough old building must be torn down to prevent an oversupply of space with its consequent bankruptcies; and it must be recognized that so far as the projects are self-liquidating they add nothing to the buying power of the community in the long run.

*In what manner and to what extent may private enterprise be affected by competition from model housing?*

Unless a sufficient quantity of existing property is acquired and destroyed, in the course of the general public-works programme, to prevent an oversupply of housing, there is no escape from serious dislocation of private enterprise.

Mr. Clarence Stein, who has spent many years in the study of housing and community planning, has won for himself a reputation as an authority on these matters which is equalled by few American architects. No one has a broader understanding than he of the difficulties which these problems present, nor has any one clung more persistently to the belief that they would eventually be overcome and so striven more determinedly to bring this about.

Here are the questions put to him, and his answers:

*What is the difference between restrictive and constructive housing legislation?*

1. Restrictive legislation attempts to improve housing conditions by the exercise of police power. Legislation such as the New York and New Jersey Tenement House Laws has done much to improve living conditions by setting up minimum standards of construction, safety, and sanitation for individual builders. But these minimum requirements, based on small-scale development, have become maximum attainments. Restrictive legislation merely says "thou shalt not" and applies only to the individual speculative methods of development.

2. A constructive housing policy has been found necessary because of the inadequacy of private initiative. The Commission of Housing and Regional Planning of the State of New York in its proposal for permanent housing relief dated February 18, 1926, said:

"When private building for profit satisfies the immediate housing demand of 30 per cent of the population, further construction becomes unprofitable. Construction usually continues as long as the market is 'favorable,' or until evidence of surplus is discovered in a downward trend in the higher rentals. Then the lending agencies become conservative and private building stops. The cycle revolves slowly. Even this limited surplus is infrequent. And this small and occasional surplus derived from housing construction intended to satisfy the demand of only 30 per cent of the population represents all that commercial enterprise ever provides to meet the constantly increasing needs of 70 per cent of the population. At all times and in all places, private enterprise has been unable to supply adequate housing to meet the needs of the underlying population.

"This condition has always prevailed. Building on a speculative basis is confined to a field which offers the margin of profit that speculative enterprise requires. The speculative method is based on a series of negotiations, a combination of independent activities and a heaping up of small profits which accumulate to put the newly constructed dwelling quite beyond the reach of the average family.

"The average family must be content with the left-overs—and there are never enough of these to permit adequate housing for more than half the population.

"A system of producing houses which is geared to satisfy less than one-third of the current requirement of society must be accounted a social failure. It may function satisfactorily in its limited field but it must be supplemented by some other producing agency if the social need for housing is ever to be satisfied."

3. Constructive housing legislation is intended to give Government a direct responsibility for producing high-standard and low-cost housing. Only through constructive legislation is it possible to prevent the continued social degeneration of our slums and the economic deterioration of our cities caused by blight.

*In what ways can Government take a constructive part in large-scale community housing that will give benefit to the occupant of the house rather than to the speculative builder?*

1. By direct action.

By direct Government construction and management, as in many countries in Europe. Or——

By a municipal housing authority as is now proposed in a bill before the legislature of the State of New York.

2. By direct Government subsidy to limited-dividend companies or municipalities, as in England, Holland, etc.

3. By indirect subsidy to limited-dividend companies:

*a.* By tax exemption, as in New York City (on buildings alone).

*b.* By federal income-tax exemption on stock dividends.

*c.* By charging a low rental on land owned by city, as proposed for Chrystie-Forsythe Street property owned by City of New York.

*d.* By municipal purchase from housing companies of land not covered by building, as in the development of the Prudential Life Insurance Company in Newark.

4. By lending money at:

(1) A low rate of interest.

(2) For large part of cost of project.

(3) For a long period, *i.e.*, at low rate of amortization.

*What is the best form of constructive assistance?*

Either——

1. Direct action of Government.

2. Lending large amounts of money at low rates of interest and amortization to companies which are restricted so as to prevent speculation and poor housing.

3. Direct subsidy—but only for those who cannot be decently housed on an economic basis.

There should be *no indirect subsidies.*

All the cost of housing should be apparent. The more clearly the books are kept, the more incentive there will be to find more economical ways of producing decent homes and communities.

*What form of constructive Governmental housing machinery now exists in this country?*

The only important example that has been tested by experience is the New York State Housing Law. Its essential features are:

1. The Government gives tax exemption on buildings, and the right of eminent domain.

2. The limited-dividend company accepts:

*a.* Limitation of 6 per cent return on investment.

*b.* Limitation of rentals, and

*c.* Supervision of the State Housing Board.

3. The mortgagee (in the past, insurance companies and savings banks, now the Reconstruction Finance Corporation) accepts limitation of 5 per cent interest.

*What development has taken place in State laws during the past year and why?*

Reconstruction Finance Corporation money, under the Emergency Relief and Construction Act, July, 1932, has been available to private corporations "formed wholly for the purpose of providing housing for families of low income or for reconstruction of slum areas, which are regulated by state or municipal laws as to rents, charges, capital structure, rate of returns, areas and methods of operation. . . ." So as to take advantage of these loans State housing laws have been passed in Ohio, Texas, and New Jersey (not yet signed by the Governor), and proposed in Arkansas, Delaware, Oregon, Minnesota, Massachusetts, Missouri, Pennsylvania, Indiana, Illinois, Wisconsin, California, and the District of Columbia.

*Why, in spite of the fact that the Emergency Relief and Construction Act was passed, has no construction of housing with Governmental money taken place?*

1. Difficulty of securing equity money, *i.e.*, the difference between cost of project and two-thirds offered by the Reconstruction Finance Corporation.

2. Even limited private initiative has disappeared.

*How can we start a large programme of housing and city rebuilding?*

This is possible at the present time only through direct Governmental action. States or municipalities should appoint Housing Authorities similar in structure to the Authority of the Port of New York. Through such an agency money made available by the Federal Government for the purpose of relieving unemployment can be applied directly and effectively to the rebuilding of the rotting areas of our cities.

These bodies should be vested with corporate power and should be able to condemn, acquire, and replan areas for the purpose of rehabilitation and community building.

Such agencies should plan, construct, and manage housing developments. At a future time, it may be possible to set up private companies to take over these developments. At the present time it is unlikely that the large amount of work that is needed, to affect the unemployment situation to any extent, can be carried on effectively and efficiently by other than direct Governmental agencies.

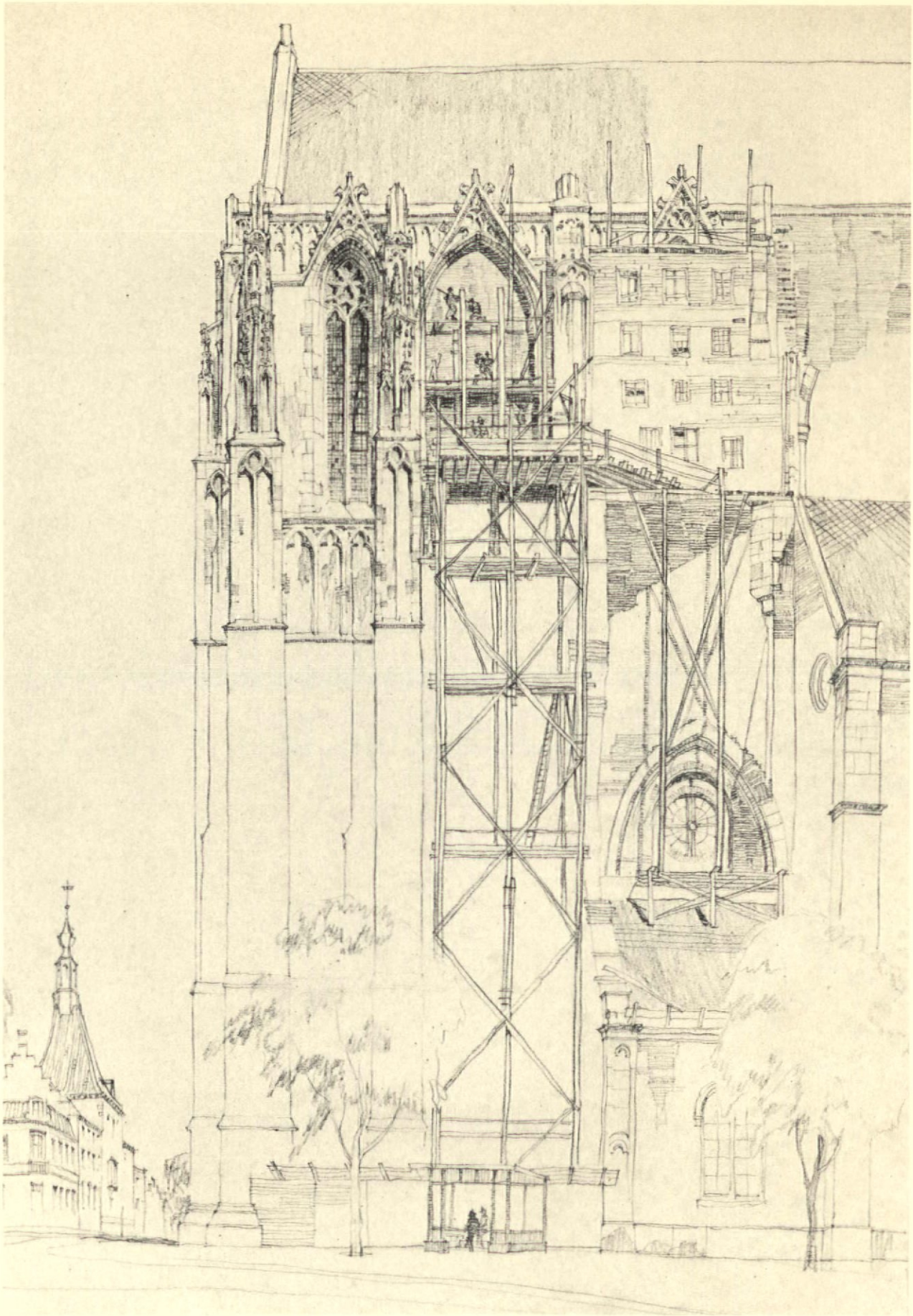
WM




OLD ALSATIAN HOUSE,
FREDERICKSBURG, TEXAS
*From the pencil drawing by E. M. Schiwetz*

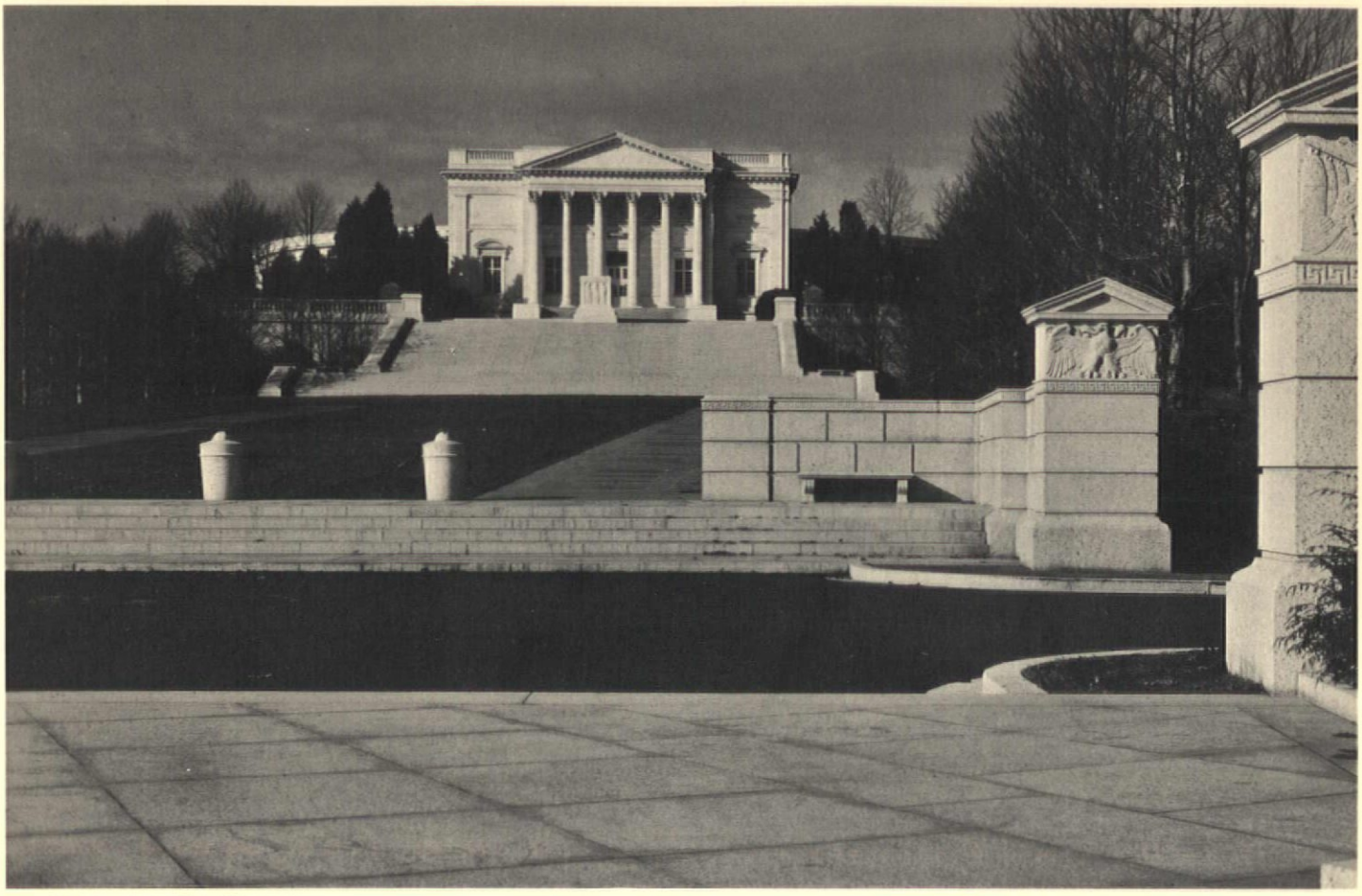



BASILICA PATRIARCAL,
MONTERREY, MEXICO
*From the pencil drawing by E. M. Schiwetz*



« ARCHITECTURE »

UTRECHT CATHEDRAL, *1929*
*From the pencil drawing by Gerald K. Geerlings*

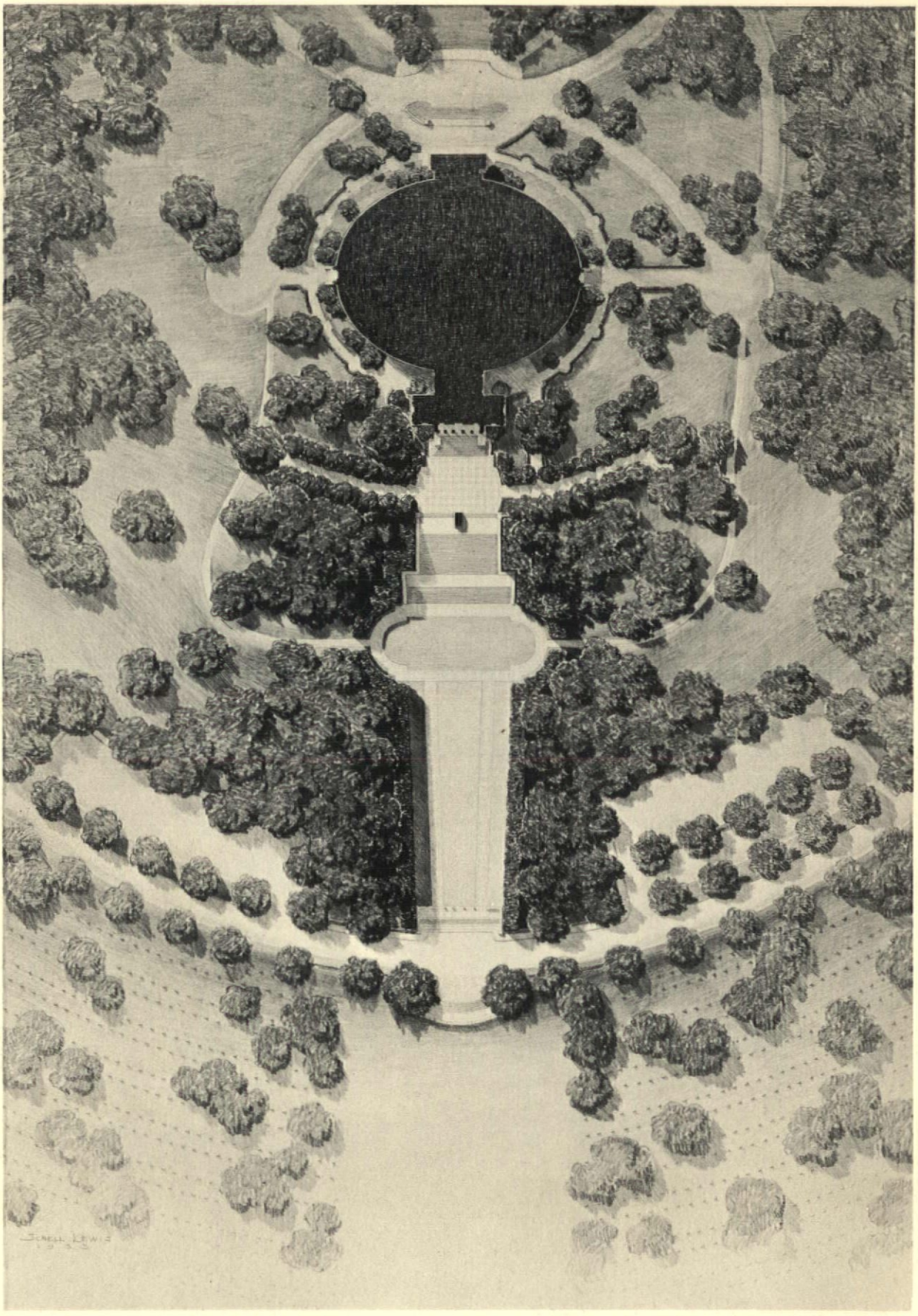


*Photographs by Theo. Horydczak*

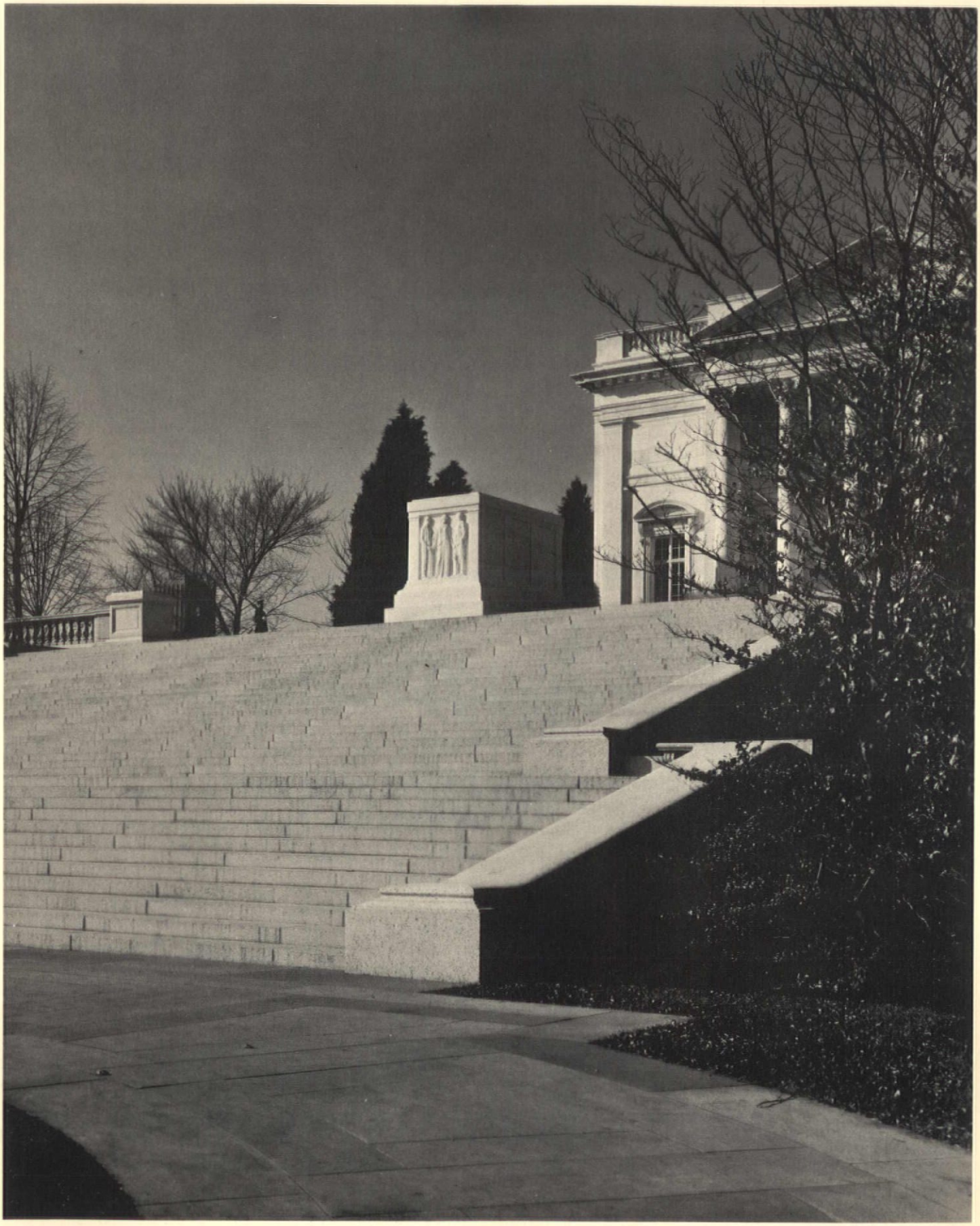
# Tomb of the Unknown Soldier and Approaches, Arlington, Va.

THOMAS HUDSON JONES, SCULPTOR
LORIMER RICH, ARCHITECT

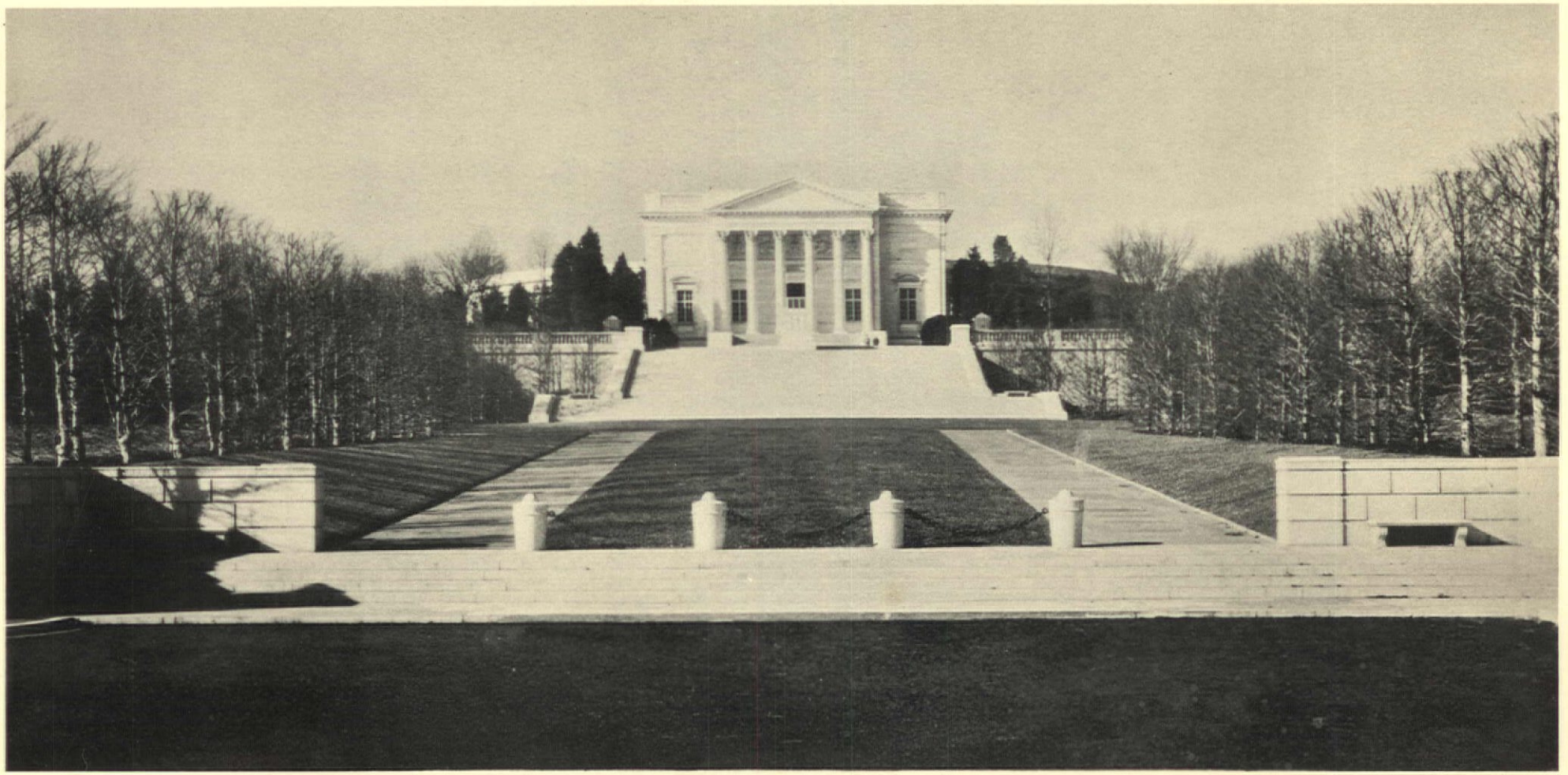
*The Amphitheatre, completed about 1917 as a memorial to the soldiers and sailors of all wars, was a single item unrelated to any broad scheme of treatment in Arlington. The architect's present task consisted of bringing this large building into relationship with the whole scheme while furnishing a fitting site for the Tomb of the Unknown Soldier. As the result of a competition held in 1928, five of the architects and sculptors entering that competition were selected to restudy their schemes and resubmit them with models of the Tomb itself. After the appointment of Messrs. Jones and Rich as sculptor and architect of the Tomb, Mr. Rich was further commissioned to design the approaches*



*Plan of the approaches to the Tomb.*
*Lorimer Rich, architect*



*The Tomb as one approaches from below.*
*Thomas Hudson Jones, sculptor; Lorimer Rich, architect*



*One arrives at the Tomb on the roadway in the foreground, leaving the conveyance and walking on foot up the gentle slope which is walled in at either side by a magnificent hedge of beech thirty feet in height. (Being but newly planted and without foliage, the hedge in this photograph lacks the impressiveness that it in reality possesses.) Lorimer Rich, architect*



*The panel on the front of the Tomb, facing Washington and the Potomac, bears three figures commemorative of the spirit of the Allies in the war—Victory in the centre, Valor on the left, Peace on the right with her palm branch to reward the devotion and sacrifice that, with Courage, made the cause of righteousness triumphant. Each side is divided into three panels by Doric pilasters, in each panel of which is carved an inverted wreath. The Tomb above its sub-base is made of only three pieces of marble—base, the block containing the sculpture, and the top slab. The marble is from Yule, Colorado, the same as that used in the Lincoln Memorial. Thomas Hudson Jones, sculptor; Lorimer Rich, architect*




*The Tomb from the rear. In the distance at the right one catches the glint of the Capitol dome. Thomas Hudson Jones, sculptor; Lorimer Rich, architect. The lettering of the inscription was designed by August Reuling*

# Drawing as a Basis for Etching

## *By Gerald K. Geerlings*









*The marginal illustrations herewith are from fountain-pen notes made on the backs of menus, envelopes, or what*



THERE is no architect-made etching in existence that I cannot spot from across the room. Why is it that usually architects can't draw?" So queries the secretary of an etching society.

"When you make an etching, for heaven's sake don't make it look like an 'architect's drawing.'" The advice which one of the leading print experts of New York gave me.

Any architect is apt to resent that, of course. Not draw? Preposterous. Why, since the age of seven——

Viewing architectural drawings done out-of-doors quite dispassionately, however, rather brings one around to agree. When an architect produces drawings with the aid of T-square and triangle he records facts and realities. The final result bears the stamp of authority. But when the architect goes out to sketch, freedom from office restrictions seems to make him less responsible. His sense of selection does not function conscientiously. He is led astray by trying to draw as he thinks he remembers some one else did, instead of recording truth to the best of his ability. Lines (particularly ridge lines on old houses) become doddering. Loosely defined shadows smother detail where it would be most informative. The sun invariably beats down with Andalusian brilliance. All surfaces glisten like the Elgin marbles. The result lacks definition, solidity, and conviction.

It is not that the outdoor drawing should resemble a labored office production. But it should not depend on flashy cleverness, catchy "picturesqueness," or repetitious tricks copied from some one else. It should have the sincerity which makes a Meryon etching vital. Particularly should this be true if the drawing is to be a reference guide for an etching, for in that medium the form must be expressed in individual lines and cannot depend on indefinite pencil smudges. Examine the work of any artist who is truly great (a form of recreation indulged in far too infrequently), and you will find the immortal quality is dependent primarily on straightforward, intelligent drawing. Not just an embroidery of inconsequential lines, but an economic structure of only the essential ones.

Almost any one can do a drawing of a million lines, but only a master can express the same truth in one hundred lines. Analyze any masterly etching or drawing and you will find the engineering bones underlie the whole structure. The mood of the subject has been studied and the chiaroscuro determined accordingly. Short-cuts are not resorted to. Each square millimetre has informative, vital lines, not meaningless straws. Lines are drawn as true as the artist's ability permitted. When a single surface, such as a roof, is depicted, there is not a false mosaic of the whitest whites and darkest blacks. In a word, there is evidence that the subject has been studied, planned, lived with.







*not, in an attempt to catch a bit of action or character for later development as accessory figures in etchings*

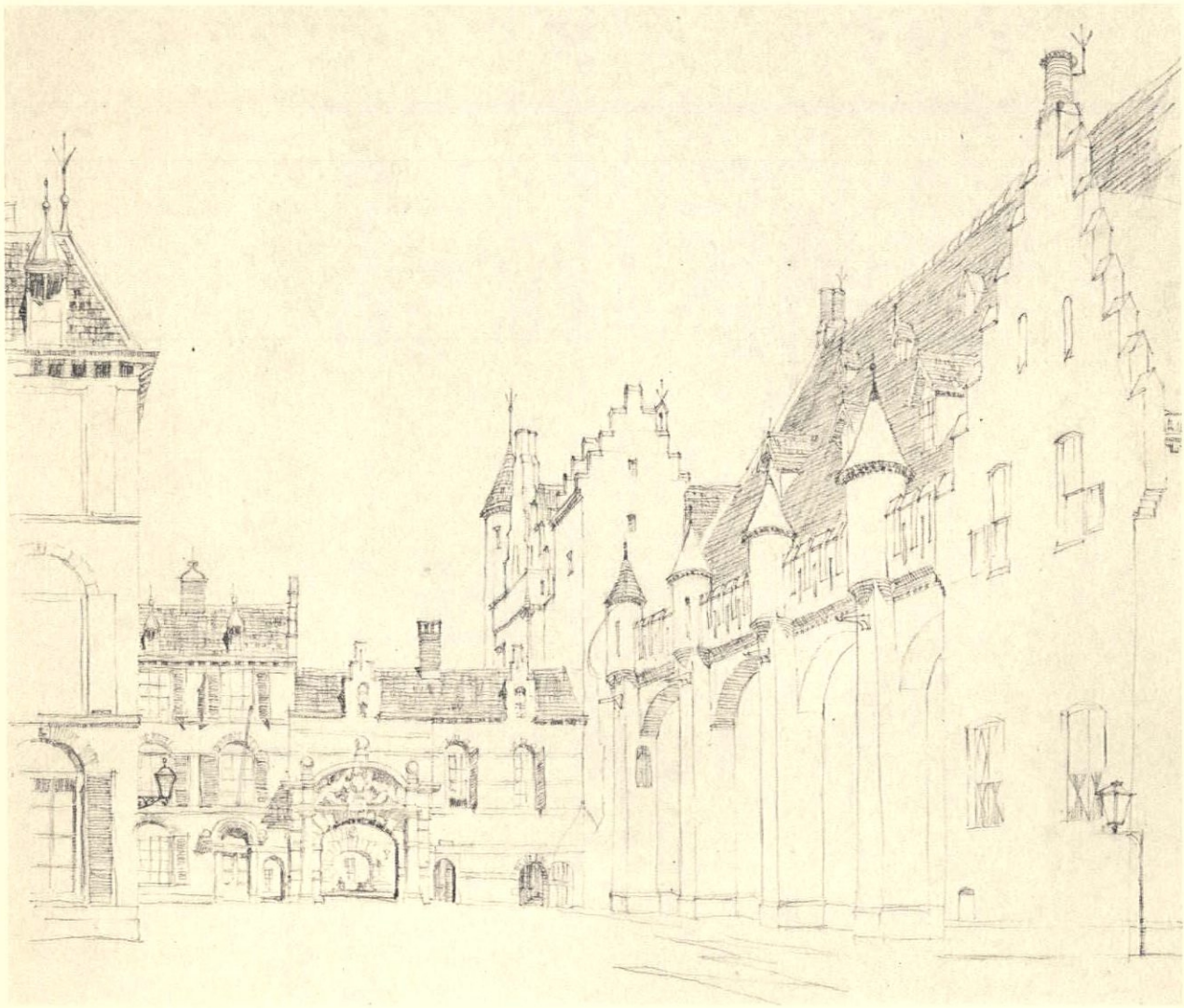




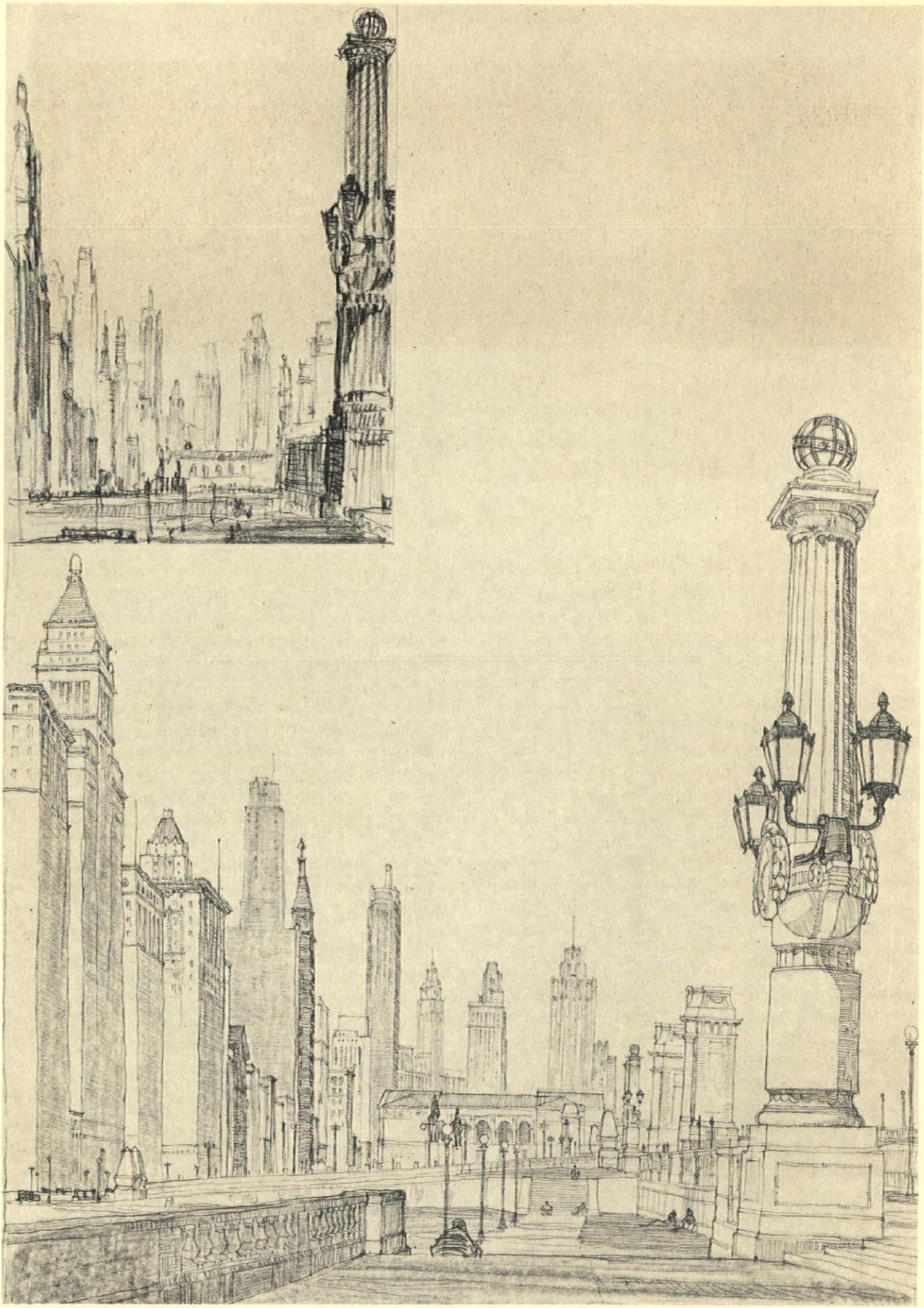
*Alkmaar, Holland; the Weighing House at Cheese Market, 1929. Other details, not reproduced, were made showing studies of porters, onlookers, reflections, cheeses, and the like*

Every artist should of course develop his own method of working. By no means are the drawings here reproduced meant to be held up as models. They are perhaps of interest because of being working drawings drawn on the spot, untouched thereafter, and executed standing up —I never am able to find a place to sit down to get what I want. Obviously they are not finished drawings; rather are they outlines for essays to be built around them later with the various details (not shown). None of them will be used as it is. Each will be composed and combined, providing it serves the purpose of creating a satisfactory interpretation of a theme. Their value to me lies in the architectural anatomy which they record, in their suggestion of masses and compositions, and in the pattern of shadows (these are mostly in outline rather than filled in). In all cases 2B "black chalk" or "carbon" pencil (synonymous terms) was used on a heavy grade of white vellum, except in the Chicago drawing on page 264, where charcoal tones were added. All reproductions are reproduced at the actual size of the originals, except the frontispiece, which has been slightly enlarged.

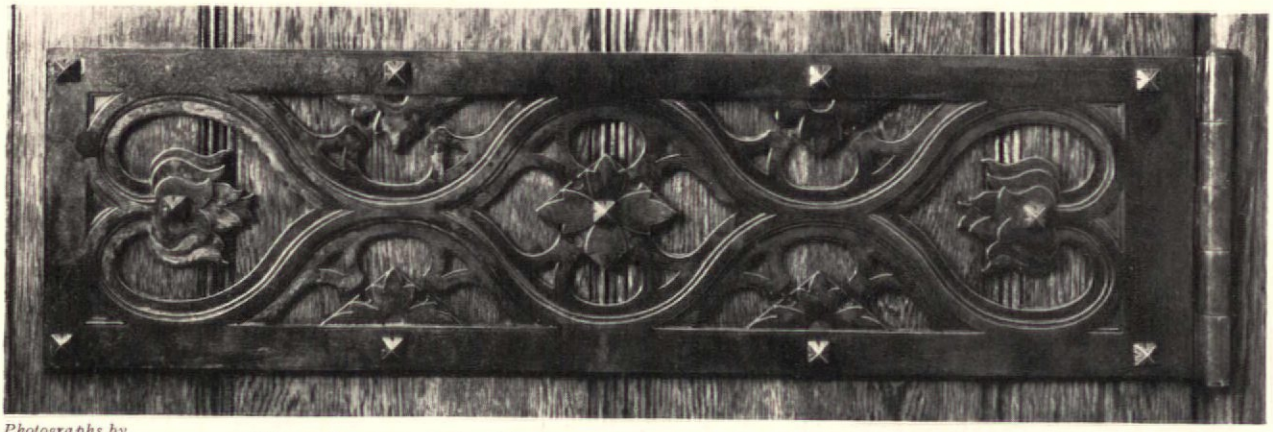




*Above—Friesland, Holland; a composite landscape. Below—Binnen Hoff, The Hague, 1929; both of these from the pencil drawings by Gerald K. Geerlings*



*Chicago : Michigan Boulevard, looking north, 1930. From the pencil drawing by Gerald K. Geerlings. The upper insert sketch is one of several made in establishing a desirable viewpoint; tones in the lower drawing consist of charcoal "washes"*



Photographs by
Ben V. Matthews

*Hinge for one of the side doors of narthex, church at Winston-Salem, built up of three flat pierced plates of steel. Mayers, Murray & Phillip, architects; craftsmanship by Ostrander & Eshleman*

# Lamination in Metal Work

## *By Eugene Clute*

PLATES and sheets of metal were hard to produce in the days before men had the heavy machinery needed to roll them from the billets and the power to operate it. Now they can be rolled easily and cheaply. While the old-time workers made little use of metal in this form, we may use plates and sheets freely and with advantage. They can be had in various thicknesses at moderate cost. Bold relief, effective scale, and a lively play of light and shade can be secured by lamination in metal work with comparatively little expenditure of labor.

One of the most natural things to do with a plate of metal is to cut out a design in silhouette. It is only a step further to pile up cut-out plates one upon another to form a design and fasten them together. It is surprising that the possibilities that lie in lamination seem to have been overlooked by designers until within the last three or four years. Now, however, several architects and craftsmen are working along this line, with some admirable results.

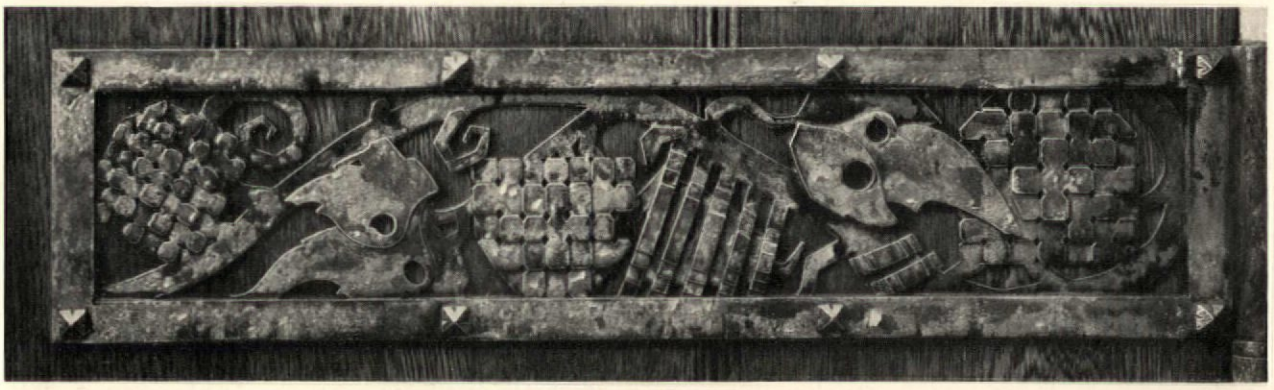
Among the most interesting examples of this technique are the hinges upon the exterior doors of the recently completed Centenary-West End Methodist Episcopal Church, South, at Winston-Salem, N. C., which are shown here by photographs and working drawings. They are the result of evolution from the limited use of lamination in the hinges of the Church of the Heavenly Rest, New York City, which was built about four years ago by the same architects, Mayers, Murray & Phillip.

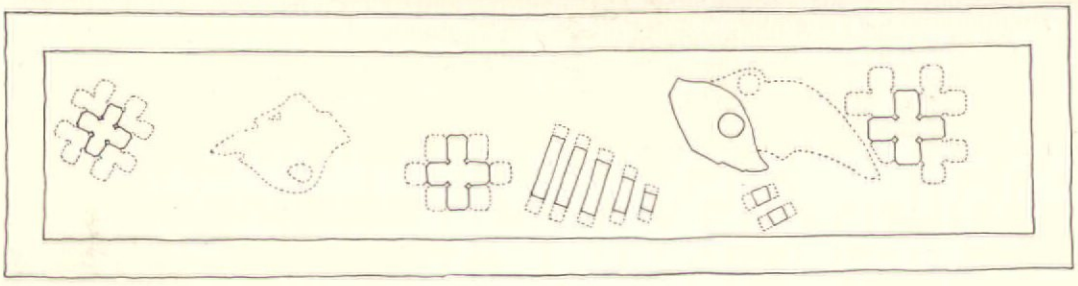
The hinges at the Church of the Heavenly Rest are very rich examples of costly hand craftsmanship, elaborately pierced, engraved and chased in a decoratively treated pictorial design of local historical significance. Lamination is employed in them only as an auxiliary method, a single plate being applied in certain parts to give the required depth.

Desiring to do something equally good in its way, but much less elaborate, for the church at Winston-Salem, the architects set about developing the designs of these hinges on the basis of lamination, with simple piercing, and in this way they became pioneers in creating a new technique in craftsmanship and a new manner of design growing out of its requirements.

In order that the designs might be fully studied in the third dimension, which is so important in laminated work, they constructed full-size cardboard models of the hinges by gluing cut-out layers of cardboard together. To study the effects of color and texture upon the designs, they applied aluminum paint and black paint to these models to simulate the appearance of half-polished wrought iron.

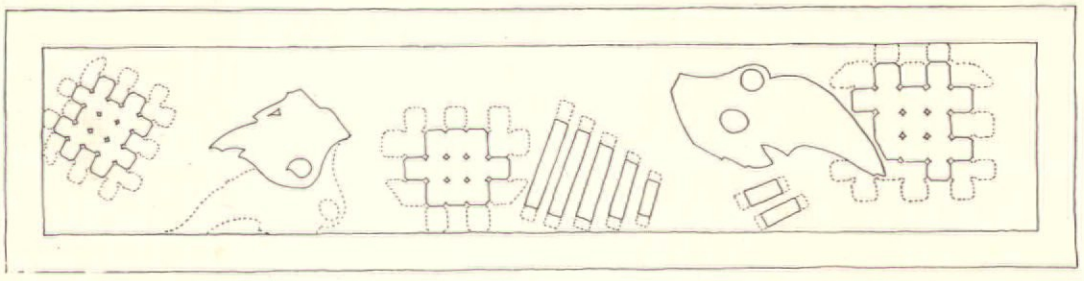
When the craftsmen—Ostrander & Eshleman—received the full-size drawings they made templates of metal for use in marking the designs upon the sheet metal. They engraved the outlines of the pieces by hand, following the templates, then cut out the pieces with a hack saw. The piercing was done also with the saw. Next they filed the pieces exactly to the engraved outlines.

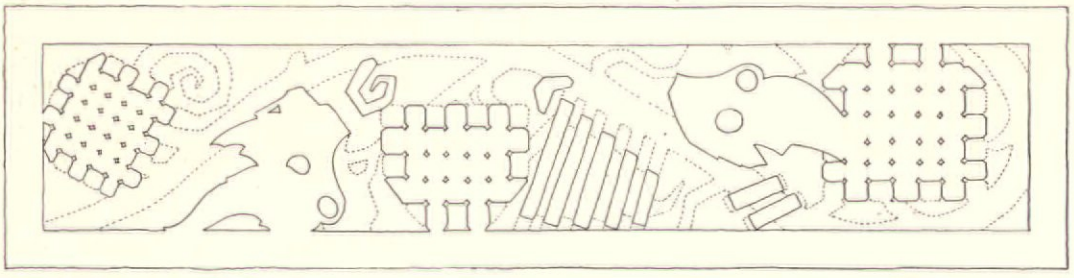




*Above, the finished hinge for the chapel door, using four plates as detailed below*

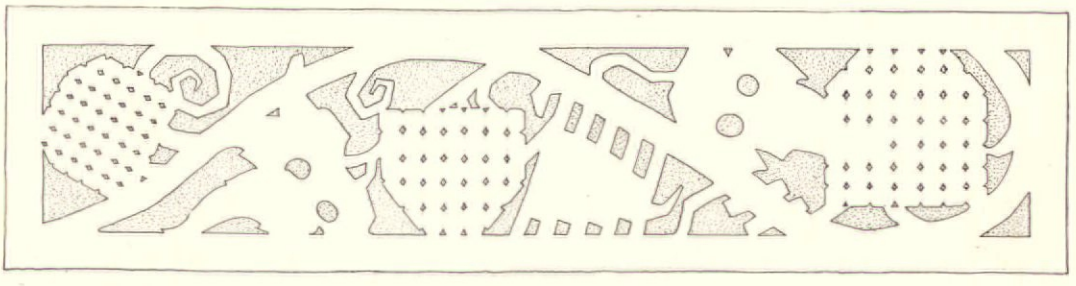
*At right, plate No. 3; above, plate No. 4. In each drawing the plate next below is shown dotted*





*At left, plate No. 2. This and the two above are each $\frac{1}{16}$ in. thick, the bottom plate being $\frac{1}{8}$ in.*

*At right, plate No. 1, next to the wood. The perforations are shown stippled*



In order that no screws, rivets, or other means of attachment might show upon the face of the work, it was determined to fasten the laminations together with pins fixed to the back of each piece. Therefore, the templates were spotted for the pins and for the holes to match them, drilled and fitted together. Then, the locations of pins and holes were transferred to the plates with a center-punch. The pins, of a non-ferrous metal, were brazed to the backs of





*One of the hinges for the main entrance door. There were eight of these, the symbol in the vesica form changing. Two of the variations are pictured at left and right, with the four plates of the eagle superimposed below.*

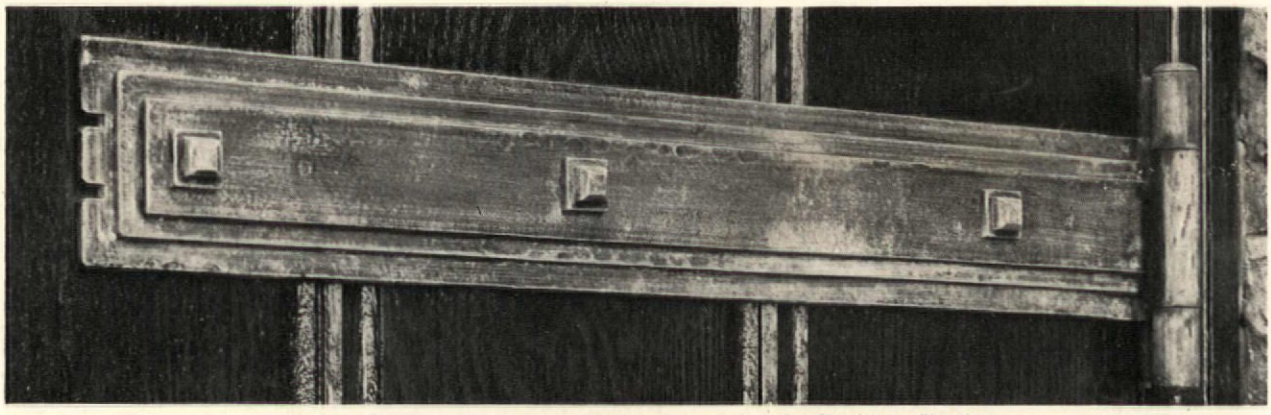




the pieces and the holes were reamed on the backs of the plates to form conical recesses.

There are knuckles at one end of each back plate of the hinges for the chapel and narthex doors, forged from the same piece, to fit upon a pintle set in the stone jamb. The hinges in the main portal have separate decorative plates. For ease in forging these knuckles, and because it can be had in desirable thicknesses, high-grade American steel was chosen as the material for the hinges. In passing, it may be noted that these hinges work easily and smoothly, for the knuckles, excepting in the hinges of the chapel doors, rest upon Tobin bronze bearings in the pintles, so designed that they may be screwed up or down and secured by a lock nut. By this means it is possible to obtain proper adjustment and make each hinge bear its share of the weight.

To prevent rusting, each part was separately cadmium-plated by a process that insures a lasting and impervious coating. Then the parts were assembled, the pins on the back of the topmost plate being inserted in the holes in the next plate below it and spread out with a hammer and punches to form countersunk rivet heads in the backs of the holes. Any projections of the pins were filed down flush with the back of the plate. The same method was carried on progressively, each plate being attached to the one beneath it, down to the back plate. As a result, any water that may find its way between the plates can do no harm, for



*A simple three-plate strap hinge of steel for the Bathing Enclosure, Jones Beach State Park, Long Island. Designed by Herbert A. Magoon, architect of the Long Island State Park Commission; craftsmanship by Ostrander & Eshleman*

each plate is completely enclosed in a material that does not rust, and the pins, being non-ferrous, cannot rust. The back plates are one-eighth inch thick and the laminæ are one-sixteenth inch thick. Four plates are used in the hinges of the doors in the main entrance and the chapel, and three plates in those for the narthex aisle doors. A half-polished finish was produced by the application of a black coating which was removed from the prominences and allowed to remain in the depressions of the surface. The texture is that produced naturally by the process of plating with cadmium, a wrinkled grain effect; there is no hammer marking or other applied texture. The metal was worked cold excepting the forging of the knuckles.

The same method has recently been employed by these craftsmen in executing the laminated hinges for the bathing enclosure at Jones Beach, State Park, Long Island. These hinges also are of high-grade American steel. They have a half-polished finish produced by applying a chemical that turns cadmium black. This is neutralized before its action has progressed far enough to harm the plating as a protective coating, and the neutralizing reagent is removed by thorough washing. Then, the resulting patine is polished off of the prominences.

Practically any metal can be used for laminated work, such as: nickel-chrome steel, Monel metal, bronze, nickel-bronze or aluminum, as well as wrought iron and mild steel. When a non-ferrous metal or alloy-steel is used which does not require protective plating, the parts can be joined by welding. Work in wrought iron and mild steel, when not to be exposed to the weather, may be unprotected and can be welded. Monel metal, various copper-base alloys, aluminum, and wrought iron may well be welded with the oxy-acetylene torch. Spot welding with the electric arc is much used in joining parts of mild steel or nickel-chrome steel. The danger of burning the metal in spot welding can be minimized by placing a thick metal plate as a backer behind the work during the process and focussing the arc in the backer instead of the work.

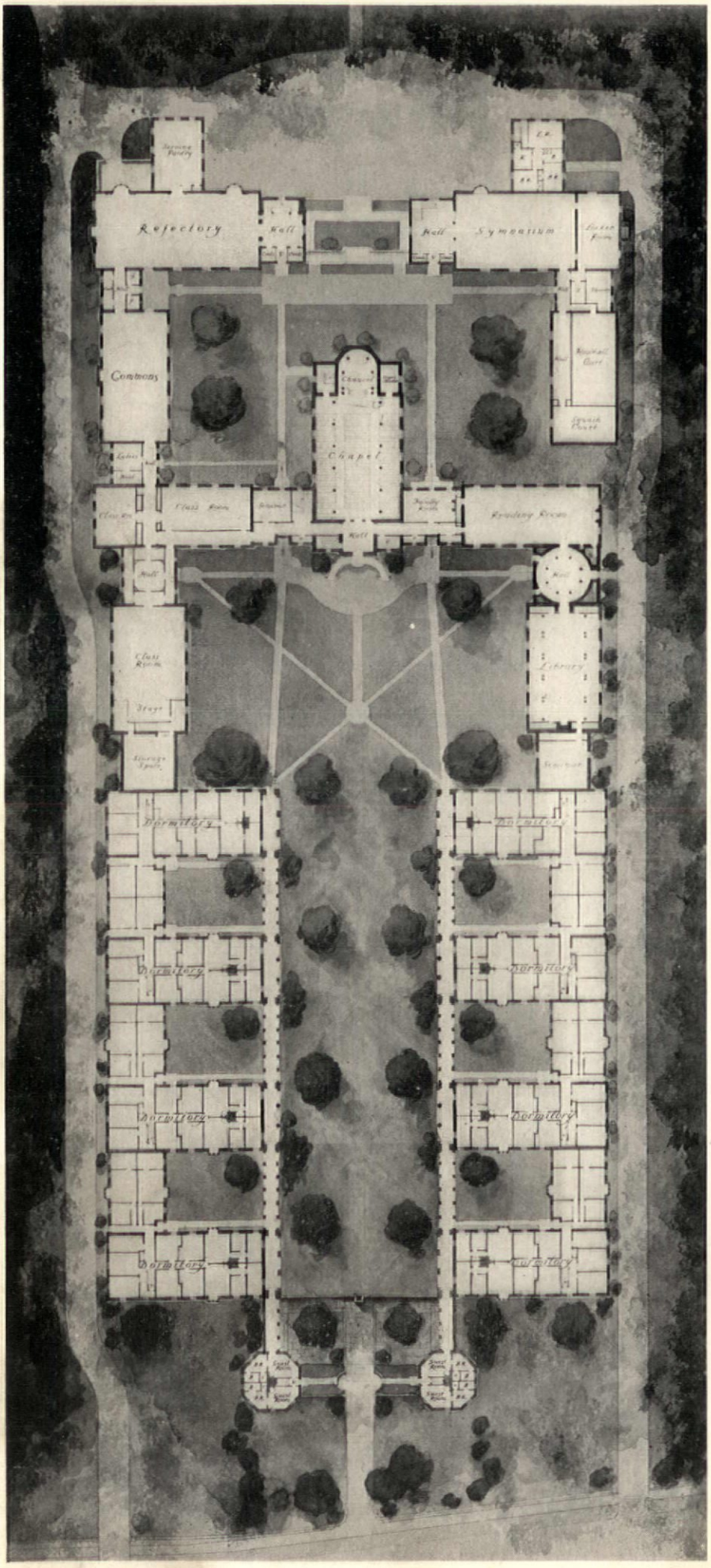
Lamination is just as applicable to the making of grilles, banking screens, doors, or any other architectural metal work as to the making of hinges. That it lends itself readily to designs of a traditional character is well demonstrated by the suitability of these church door hinges to their place. Something very like this, we may assume, is what the mediæval craftsmen would have done if plates of metal had been as available in their times as they are in our day.

There is nothing to prevent the combination of various metals in laminated work, if those metals which tend to set up destructive electrolytic action are not used together, or if they are used with effective electrical insulation between them. A new method of electrical insulation developed by Oscar B. Bach, and employed in the making of the colossal repoussé decorations in combinations of various metals for Radio City, makes it possible to use any desired metals together freely. As a rule it may be said that metals of a more or less similar nature may be used in combination without insulation. For example: bronze, Monel metal, nickel-bronze, and copper; or iron, steel, and nickel-chrome steel. Iron and copper are frequently combined. Care should be used in combining other metals, the special conditions to which the work is to be subjected being taken into account and met by the precautions of an experienced craftsman.



# The Yale Divinity School
# New Haven, Conn.

DELANO & ALDRICH, ARCHITECTS






THE authorities in charge of the new Yale Divinity School, and the architects, were in accord in their desire to carry out the programme in a kind of architecture which, first of all, should avoid elaboration, richness of ornamentation, and the consequent added expense; and, second, should express in a free and untrammelled way the traditions of old New Haven, of which the key is struck by the ancient buildings of the University and the town and especially by the three churches on the Green, unique in America, or anywhere else for that matter. The scheme was worked out along these lines with the result that while some other recent buildings destined for purely secular use are of a mediæval architecture usually associated in the public mind with the Church, the Divinity School itself, dominated by its Chapel and dedicated to religious education, is in the cool and restrained Georgian of Puritan New England.



*A view from the upper end of the campus where the Chapel dominates the dormitory ranges. Although quite different in detail, there is something in these buildings that is akin to Jefferson's University of Virginia*

These buildings depend for their interest almost entirely upon their form and grouping, determined largely by the levels of the site. The ground slopes gradually from the entrance up to the dominating Chapel at the highest point, behind which on a broad grassy terrace are the Commons and Refectory on one side, and the Gymnasium, hand-ball courts, etc., on the other. Beyond this the land slopes steeply down. In front of the Chapel, on a wide campus, are the Libraries, entered through a circular rotunda, and the Auditorium, and in front of these again the dormitories with grass courts between, connected by arcades. Flanking the entrance are the two small octagonal guest houses. All of these buildings are of simple masonry in a warm pinkish brick which comes from kilns near New Haven. In the Chapel itself an effort has been made—and apparently appreciated—to give a churchly atmosphere while holding to the Georgian style. We believe that the buildings speak for themselves and that they hang together as a unit in expressing the rather austere type of feeling and teaching associated with the Yale Divinity School, one of the oldest institutions in New England.



*In the Chapel the simple rectangular plan with its apsidal chancel carries forward into a more sophisticated age the dignity and austerity of the colonial meeting-house*



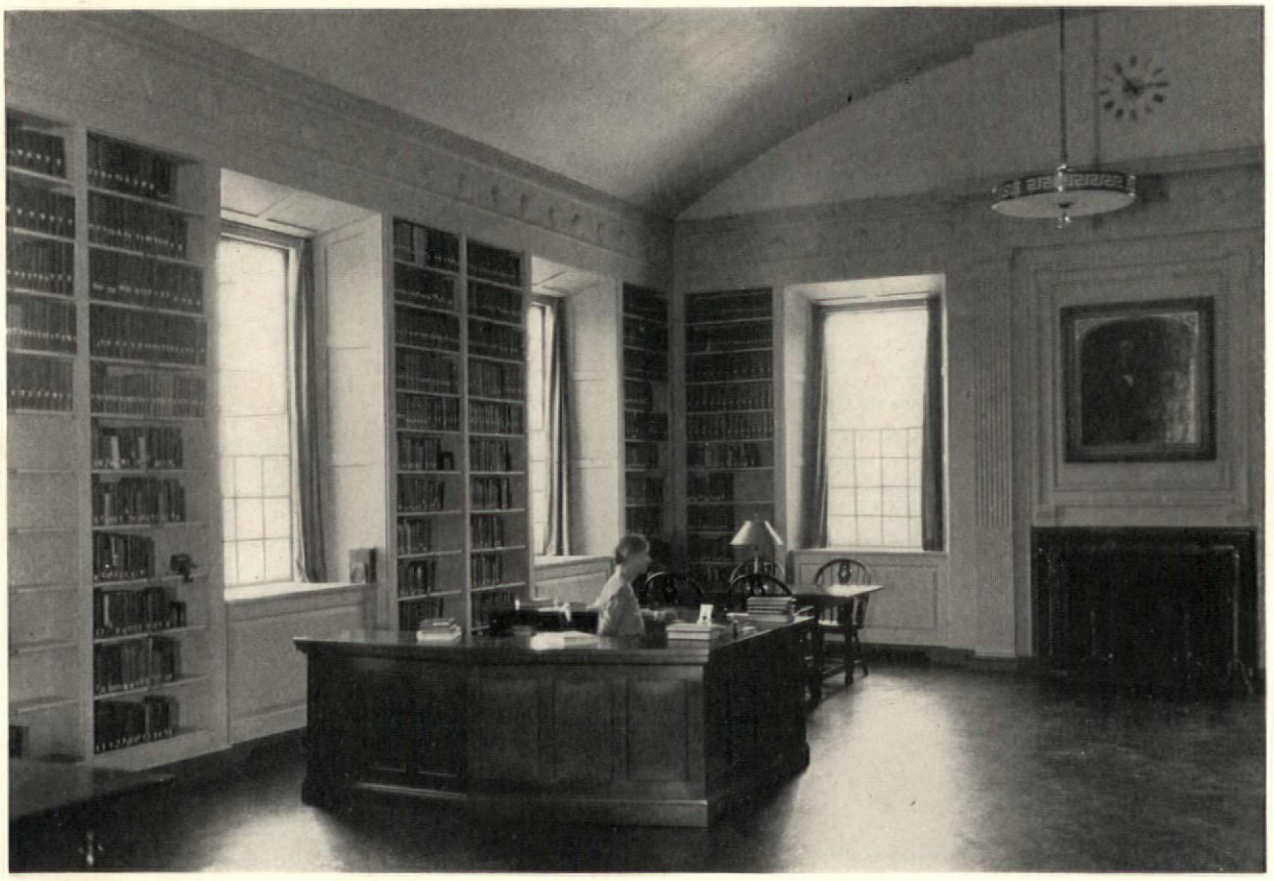
*On the page facing, a detail of the chancel. The lighting fixtures were executed by Cox, Nostrand & Gunnison from the architects' designs; the central fixtures are of chrome-plated brass, glass rods and a spiral arrangement of the lamps around the central support—the eagle and tassel are gold-plated*

*The circular hall connecting the Library with the Reading Room, shown on the plan (page 270) to the right of the Chapel*





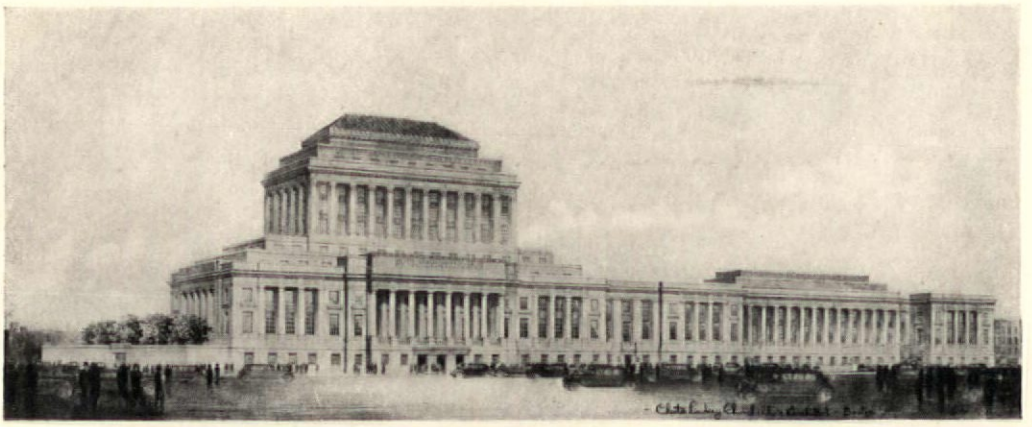
*Above: the Commons Room, in which one unusual feature is found in the lighting fixtures of carved wood, touched with gilding. Below, a corner of the Reading Room*





A Photographic Study by Robert MacLean Glasgow

*Entered in a contest held by the National Alliance of Art and Industry, this photograph was selected as one of the "hundred best"*



*The Christian Science Publishing Society's building, now being erected in Boston. It is to have a length of 600 feet, and will be completed later this year. Chester Lindsay Churchill, architect*

# Architectural News



*The Home Office Building, Metropolitan Life Insurance Company, New York City, recently completed. D. Everett Waid and Harvey Wiley Corbett, architects*



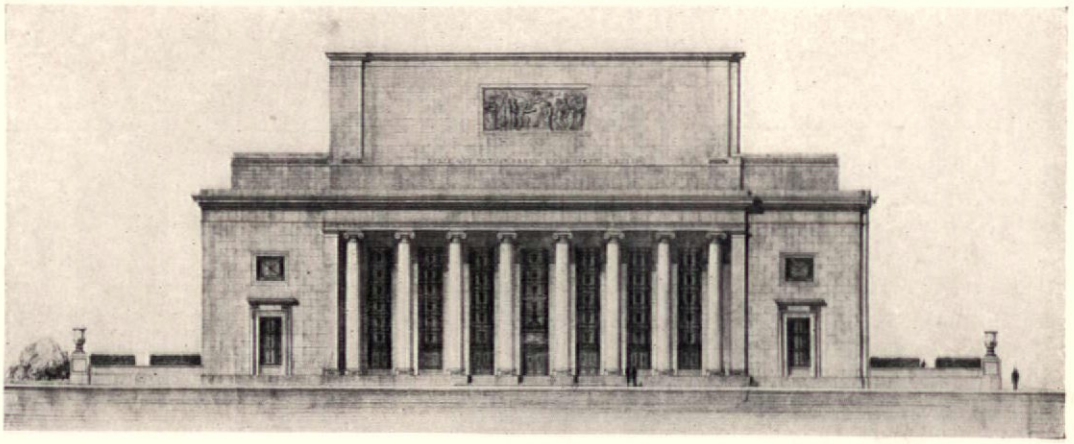
*A model of Old State House Square, Hartford, Conn., with the post-office building demolished and the park restored (with underground parking space) about the Bulfinch State House. Lester Beach Scheide, Inc., architects; model by Elizabeth Judd Scheide*

*The foundations are in for this annex to the Post Office Building on Ninth Avenue, New York City. McKim, Mead & White, architects*



*Below, the Benjamin Franklin Memorial and Franklin Institute Museum, Philadelphia, now nearing completion. John T. Windrim, architect*





*Façade of the American Philosophical Society's new building proposed for Philadelphia, for which a site on the Parkway has been acquired. Paul P. Cret, architect*

# in Photographs



*The Dime Savings Bank Building, Brooklyn, which is to be decorated with a bronze tablet as the recipient of an annual award by the Brooklyn Chamber of Commerce. Halsey, McCormack & Helmer, Inc., architects*



*Sundial designed by Cass Gilbert and presented by Mr. and Mrs. Gilbert to Shakespeare's Garden, Stratford-on-Avon. The panels, representing the seven ages of man, were modelled by John Donnelly, and the stone cutting done in England*



*The new school building for Florham Park, a section of Madison, N. J., not all of which building is to be built at once. Rasmussen & Wayland, architects*




*"There ought to be a law"—but apparently it has not yet been put on the statute books, for the creation on the left exists in Los Angeles, and that on the right in Portland, Ore.*



# BOOK REVIEWS

COMPOSITION AND RENDERING. By A. THORNTON BISHOP. 128 pages, 7 by 10½ inches. Illustrations from pencil drawings. New York: 1933: John Wiley & Sons, Inc. $2.75.

Mr. Bishop, whose pencil drawings are widely and favorably known, lays great stress in this volume on composition, discussing its essentials, and showing parallel drawings illustrating possession of and lack of the fundamental qualifications. He presents also a detailed exposition of pencil indication of building materials and accessories. There is also a chapter on composition in the theatre.

GARDENS AND GARDENING. Edited by F. A. MERCER. 128 pages, 8 by 11½ inches. Illustrations from photographs and plans. Printed in Great Britain. New York: 1933: The Studio Publications, Inc. Cloth, $3.50; wrapper, $2.50.

This is the second issue of *The Studio Gardening Annual*—a creditable relative of *The Studio's* year books on various subjects. In addition to almost inspiring photographs of the gardens of many nations, there are constructive articles on the flowering shrubs, small gardens for pleasure and profit, and perennials in the modern garden, and a few illustrations of some new and lesser-known plants.

SHEAR TESTS OF REINFORCED BRICK MASONRY BEAMS. By D. E. PARSONS, A. H. STANG, and J. W. MCBURNEY. 20 pages, 6 by 9¼ inches. Illustrations from photographs and diagrams. Research Paper No. 504. Pamphlet binding. Washington: 1933: U. S. Department of Commerce, Bureau of Standards. 5 cents.

NEW ORLEANS. Its Old Houses, Shops and Public Buildings. By NATHANIEL CORTLANDT CURTIS. 267 pages, 5¾ by 8¾ inches. Illustrations from two drawings in color, photographs, line drawings, and maps. Philadelphia: 1933: J. B. Lippincott Co. $3.50.

The old saying that a city has a physiognomy could scarcely be better exemplified than in the case of New Orleans, and the author, who is an architect and a lecturer at Tulane University, has successfully caught the characteristics that give New Orleans its distinct individuality. Mr. Curtis not only has an inspiring subject for his book, but displays unusual charm in unfolding it.

THE NEW ILLUSTRATED GARDENING ENCYCLOPÆDIA. Edited by RICHARD SUDELL. 1152 pages, 5½ by 8 inches. Illustrations from photographs and drawings, with colored frontispiece. Printed in Great Britain. New York: 1933: Charles Scribner's Sons.

As soon as the amateur gardener has passed the early stages of his fever, the seed catalogues and the specialized reference books will tax more and more frequently his ability to find answers to questions that arise in his work. Here is a book designed to answer many of those questions through easy alphabetical access to subject matter and to data concerning individual plants. Moreover, certain sections dealing with popular specialties are treated much more fully and in accordance with the latest approved practices. There is even a special calendar of garden operations by months, the months being found as headings in the regular alphabetical sequence.

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS GUIDE, 1933. 831 pages, 6 by 9 inches. Illustrations from diagrams. New York: 1933: American Society of Heating and Ventilating Engineers. $5.

An indispensable collection of reference data on the design and specification of heating and ventilating systems. These annual volumes, of which this is the eleventh, bring a fast-moving science up to date in the practitioner's office.

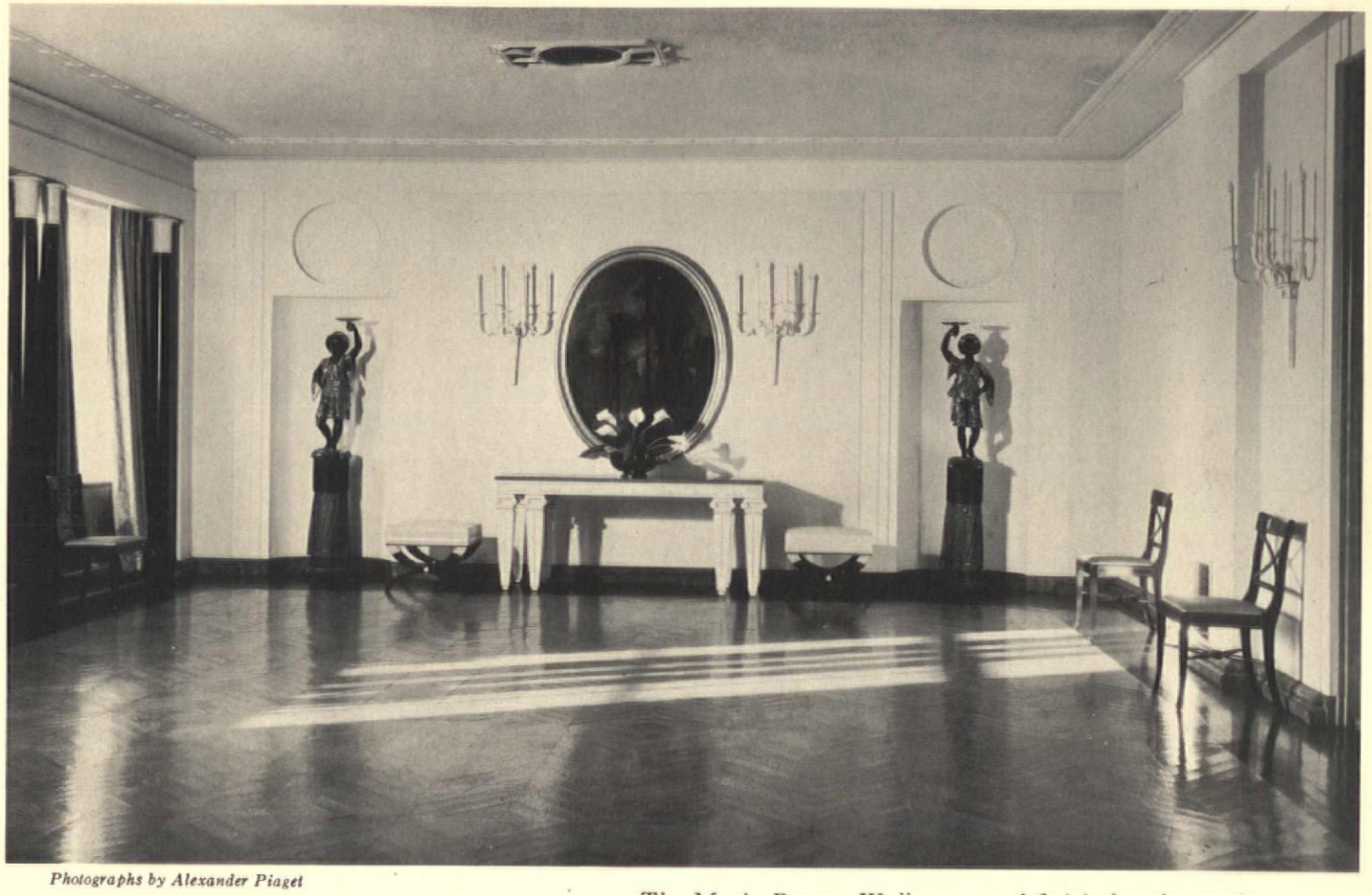
THE NEW VISION. By MOHOLY-NAGY. Translated by DAPHNE M. HOFFMANN. 191 pages, 7½ by 10 inches. Illustrations from photographs, paintings, and sculpture. Printed in Germany. New York: 1932: Harcourt, Brace & Co. $5.

Here is a detailed analysis of a new attitude toward art education, largely as put into practice by the Bauhaus. The author was a lecturer at the Bauhaus in Weimar and Dessau, 1923–1928, and has had the benefit of practical experience with these new theories of teaching.

PENETRATION OF DAYLIGHT AND SUNLIGHT INTO BUILDINGS. 2d edition. Illumination Research Technical Paper No. 7. 34 pages, 6 by 9¾ inches. Illustrations from diagrams and graphs. Pamphlet binding. Printed in Great Britain. New York: 1932: His Majesty's Stationery Office (The British Library of Information). 20 cents.

CODE FOR PROTECTION AGAINST LIGHTNING. 93 pages, 5 by 7½ inches. Illustrations from photographs. Handbook of the Bureau of Standards, No. 17. Pamphlet binding. Washington: 1932: U. S. Department of Commerce, Bureau of Standards. 15 cents.

There has been a tendency in this generation to regard protection against lightning as more or less of an outworn fetish. As a matter of fact, the annual fatalities from lightning in the United States are about 500, with about 1300 injured. Moreover, in Iowa, over a five-year period, there were twenty-nine unprotected buildings destroyed for every rodded building destroyed by lightning—and this in the face of a large proportion of obviously defective installations.



Photographs by Alexander Piaget

*The Music Room. Walls are sand-finished and smooth white plaster; the ceiling gray. There is a parquetry floor with black border in oak; lapis-colored baseboard; ebonized colonnettes with gray marbled capitals. The curtains are silver, gold, and yellow. Furniture and lighting fixtures were designed by the architects*

# Public Rooms of The Park Plaza, St. Louis, Mo.

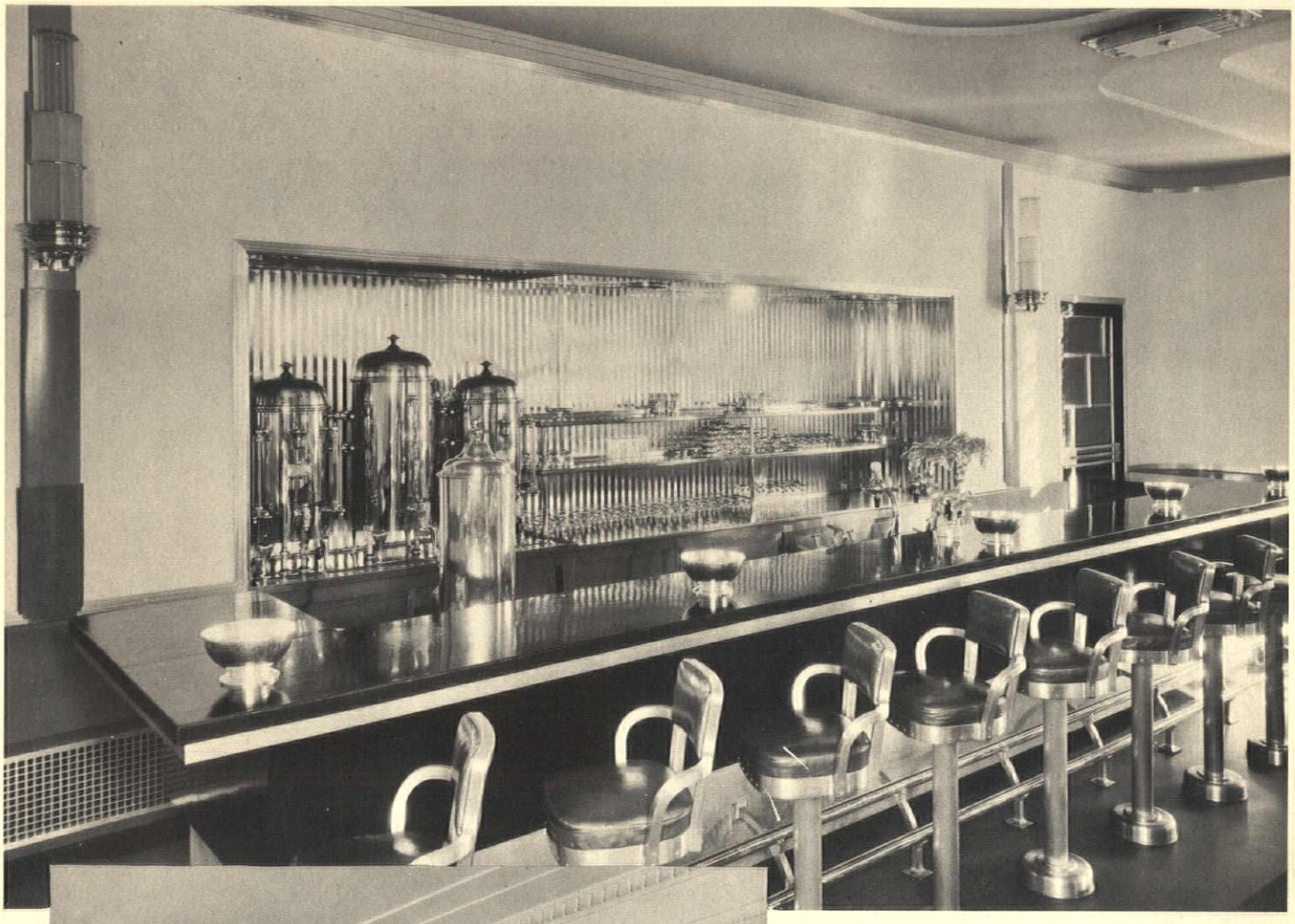
HALL & PROETZ
ARCHITECTS FOR
THE PUBLIC ROOMS



*The Lacquer Room—a private dining-room. Two end walls and a dado are in yellow lacquer; the side walls covered with glazed chintz designed by Albert Herter. The carpet is gray bordered with black; the furniture upholstered in black horsehair*



*The Marine Dining-room. Walls, chalk white; columns, with carved wood marine motifs, in white lacquer; upper dado, cobalt blue; balustrade in gray lacquer; windows in cherry lacquer. Lower floor is stained pink; the ceiling covered with gold foil*



*The Coffee Bar. There is a linoleum floor, dado, and ceiling in nine gradations of gray; flat wall surfaces, butter yellow; trim, fixtures, furniture, etc., aluminum. Upholstery is in metallic blue leather; bar in black rubber; the mirror doors, gray*



*A typical elevator lobby. Walls are white; trim, marbleized Prussian blue-green; console and chairs in white, black, and gold, the chairs having seats of black patent-leather*



*The Empire Room. Walls and ceiling are white; pilasters of Pyrenees black-and-white marble with cast pewter capitals; the chimney piece, white with Grand Antique marble; chandeliers are pewter and crystal; the carpet, peach color; the furniture in ebony and curly maple upholstered in cloth-of-gold*

# Some Pitfalls in Supervision

## *By W. F. Bartels*

XXXI. MECHANICAL APPURTENANCES

(*CONTINUED*)

OF course, closed tanks should be tested in the presence of the superintendent for an overpressure of at least 50 per cent more than their service maximum. The hot-water tank is usually of this type and is generally fed from the house tank by gravity. The material of which the tank is made should comply with that which has been specified, both as to thickness and quality of the material. Riveting should be so done that there is but little leakage and so that an excessive amount of calking is unnecessary. The superintendent should see that all the reenforcing around the connections called for has been provided. Ascertaining that the outlets are in their proper location is a wise precaution. After connections have been made, tests may be asked for, to determine the tightness of the tank. When this has been done and the tank emptied of water, the superintendent should see that it is thoroughly cleaned, dried and then coated with one of the better tank preservatives. If the tank has arrived on the job without a coat of red lead it should be cleaned and the exterior then painted, followed by another coat as soon as the first is dry. These coats of paint will of course not be put on while the tank contains water, because of the danger of sweating during the painting. Some architects have found that a coat of aluminum paint over the red lead is very satisfactory, but aluminum paint to be at its best should be freshly made from the powder. Before the tank is finally turned over to the owner the superintendent should see that it is emptied of all water and the sludge removed. Otherwise any stirring up of this sludge will not only cause muddy water but it may cause trouble by getting into some of the valves.

Domestic hot-water heaters are of many types. There are those which use an interior steam coil to heat the water in the tank, while others derive their heat from coils attached directly to the side of the boiler. But no matter what system is used, once selected by the architect or engineer, it is the superintendent's duty to see that all specifications in regard to it are faithfully complied with. I was once called back to a job where a side heater had been installed, the owner complaining that not enough heat was forthcoming. Armed with the specification and the rating book of the heating manufacturer, I assured the owner that theoretically enough hot water *should* be coming from the heater. But the fact remained that it was not. Digging into the covering on the heater, it was found that the number on the heater corresponded correctly to the one specified. But further investigation under the insulation disclosed the fact that the heater was joined to the boiler both top and bottom by a 1-inch pipe, while the outlet of the heater was made for a 2½-inch connection! The boiler had been delivered to the job tapped for a 1-inch outlet. Finding it thus, rather than laboriously drilling a 2½-inch hole, the mechanic had bushed the heater outlet down to one inch and covered it before any one saw it.

In the small house as well as in the large one, the superintendent should remember that all heat supplied to an indirect heater for hot water is taken away from the boiler. Unless a boiler is of sufficient size to take care of both the hot water and the steam, considerable dissatisfaction may result. It is evident that the size of both the boiler and the hot-water heater must be checked back against the specifications and the manufacturer's catalogue to see that the proper size has been delivered to the job. Then too, all such other equipment as thermometers, gauges, the rheostats, etc., must be gone over to see that they have been delivered to the job. Proper valves to cut off the storage tank from the heater, and the heater from the water supply, should be furnished. These may also provide for cleaning or removing coils without shutting down the main boiler, or for cutting off the flow through a heater not in use, such as might be required when a small heater is used for hot water in the summer and indirect heating from a large boiler in the winter. There is no use in allowing a flow of hot water to warm the water in the large boiler during the summer, which is what will happen unless there is a valve to shut this circulation off. A valve installed at a point to prevent this will save many B.t.u.'s. It may often seem that too many valves, capped tee outlets, etc., are being demanded, but the convenience they afford and the time and money

that they save when repairs are made, will more than compensate for the cost of their installation.

It is quite obvious that adequate covering of boilers and pipes is essential in conserving heat. When a boiler is properly insulated the room is not only more comfortable for the persons who must be there, but also more comforting on the check book of the man who foots the fuel bill. Many superintendents are prone to pass hurriedly over insulating work, feeling that it is only "fancy work." But if they were apprised of the astonishing amount of heat saved by good insulation, they would never need to be retold to insist on a first-class job. On tanks and boiler work, blocks of magnesia should be wired on, with a wire mesh fastened on top of them to provide the finish coat with a ground to which it can securely adhere. Another material may be obtained which has metal lath already fastened to it.

Many contrivances are used in connection with boilers besides hot-water heaters and the superintendent must be constantly on guard to prevent any palming off of an inferior article upon an owner unless the latter fully understands exactly what he is getting and what refund is to be given.

An illustration might be mentioned which, while covering one particular item, might be considered typical of many similar tests which might be asked for. An appliance which used the condensate of a steam system for heating the hot water of a building, also had a steam connection in case the condensate did not furnish enough heat to raise the water temperature to the proper degree. The appliance had been specified to perform certain functions, namely that a definite amount of condensate returning to this heater would raise a certain amount of water leaving the appliance a stipulated number of degrees. When the superintendent asked to have a test made he was told that it would be foolish, because all the needs for hot water were being supplied by the appliance and it had never once been necessary to cut in the live steam to help the condensate out. This answer, it will be seen at once, was irrelevant, unless other factors were known. The question might be asked, "Suppose there was an abnormal condensate over the period, and an underestimated amount of hot water used. The appliance might only be doing a quarter of the work it was supposed to and yet for a while might "get away with it." And again it will be seen that the superintendent must follow through in tests.

There is no dearth of pumps on the market today. However fortunate that may be, it is no wonder that the architect is often in a quandary as to which one to select. Each one seems to possess one or two specific and individual valuable features. And, according to their sponsors, the lack of this or that gadget on competitive makes automatically settles the choice.

The superintendent is apt to be in a dilemma when inspecting the pump and its installation. He is beset with such an array of conflicting considerations, and such sheafs of pamphlets with miscellaneous data, curves, graphs, peculiar terms, and highly specialized information, that he is to be excused for sometimes being in a mental fog as to how to proceed. But, be they vacuum, suction lift, pressure, force, or other types, these pumps are built to perform certain work according to specific requirements, if they are to operate successfully. The superintendent should make sure that everything within reason is done to co-operate with the concern supplying the pump so that there may be no argument later that the pump is failing to do its job because "such and such an item was not properly provided or attended to" for the pump contractor.

The proper location of pumps is an important item. While it seems perfectly obvious that they must be readily accessible from all sides, and the lighting more than adequate, nevertheless these are often not provided for on the architect's drawings. There must be ample room to get at the pump in case of repairs, when new parts must be substituted or swung into position. The pump should not require specially formed mechanics. In one building I recall that a pump was so located that it required not only a tall, thin man but one with a gorilla's arms to get at the oil cups. The oiler in charge possessed neither of these qualifications; unfortunately he had both short arms and a generous girth. One day the oiler ran to his chief with word that the pump bearings were "frozen." The oil cups were filled to the top and nobody could understand why the bearings could "freeze" with the cups full of oil—except possibly the oiler, who then realized that filling them after the bearings had "frozen" was of little value. Then too, the turns and run of pipe necessary to reach a central point must be considered. These add to the vibration and friction and should be avoided as far as possible.

(*To be continued*)

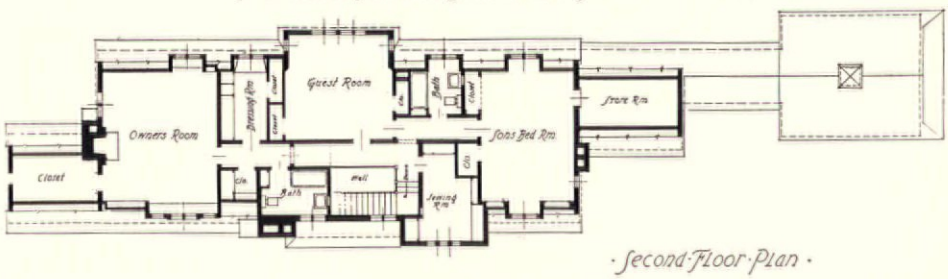


*Photograph by Tyner & Murphy*

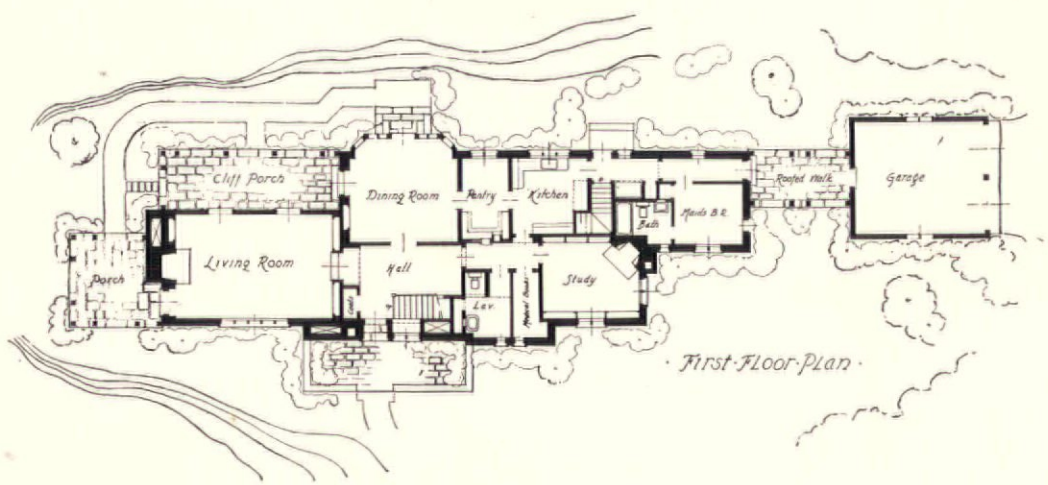
# House of Dr. Thomas G. Orr, Kansas City, Mo.

EDWARD BUEHLER DELK, ARCHITECT

*This house received the 1930 medal of the Kansas City Chapter, A. I. A., in the residential class. The long plan is explained by the site, the house following the bank of a water course*




·Second·Floor·Plan·




·First·Floor·Plan·



*Photograph by Anderson*

*Detail of the main entrance*

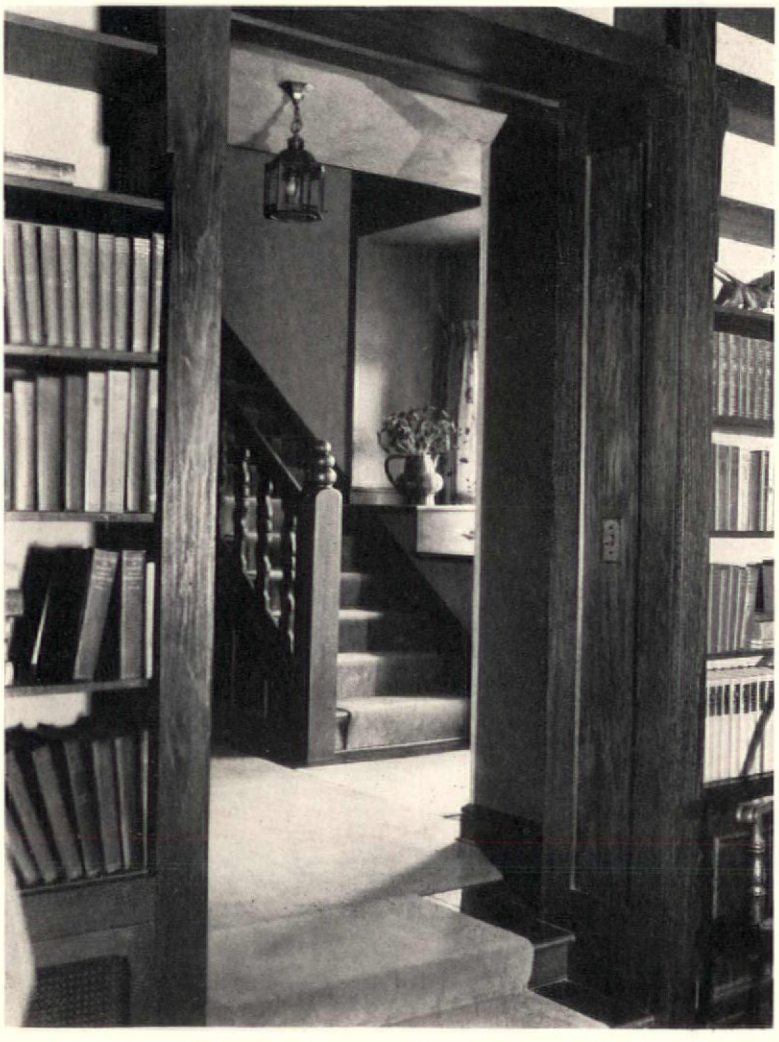


*Photographs by Clara H. Sparks*

*The fireplace end of the living-room*

## House of Dr. Thomas G. Orr, Kansas City, Mo.

EDWARD BUEHLER DELK, ARCHITECT



*Looking into the hall from the lower level of the living-room*



*Photograph by Clara H. Sparks*

*Dining-room, largely of glass on the side toward the water*

HOUSE OF DR. THOMAS G. ORR,
KANSAS CITY, MO.

EDWARD BUEHLER DELK, ARCHITECT



*The stair hall*

*Photograph by Anderson*

# The Editor's Diary

*Friday, February 24.*—Although the facts have been rather widely known for some time, I was rather jarred to realize that out of one hundred forty-five million dollars set aside by Congress for public-building construction this fiscal year, one fifth of it will be spent within the small area constituting the District of Columbia. The Federal projects under way in Washington are as follows:

| | |
|---|---|
| Extension building, Department of Agriculture | $12,800,000 |
| Archives Building | 8,750,000 |
| Central heating plant | 5,749,000 |
| Labor Department and Interstate Commerce | 11,250,000 |
| Department of Justice Building | 12,000,000 |
| Postoffice Department | 10,300,000 |
| Public Health Service | 908,250 |
| Annex to city postoffice | 4,000,000 |
| Addition to Senate Office Building | 2,146,669 |
| House Office Building addition | 582,901 |
| Supreme Court Building | 8,381,980 |
| Addition to Congressional Library | 1,123,000 |
| Development of Botanical Gardens | 739,166 |
| Congressional garage and terrace development, including the subway fountains | 806,001 |
| Total | $78,536,967 |

*Saturday, February 25.*—Varying from the usual custom of presenting its medals on the night of the formal opening, the League for this year's Show postponed the ceremonies until today. There was nothing particularly surprising to most of us in the details of the awards (page 211 of the April ARCHITECTURE). Joseph Urban was the big hero of the occasion in receiving two medals. One of these, the President's Medal, has not been awarded for some years, and it was a particularly popular gesture when it was given this year to the man who put together what, as a unit, is considered one of the most effective exhibitions in its manner of presentation that the League has ever staged

*Tuesday, February 28.*—The evidence continues to pile up in substantiation of the belief that a really large programme of public works offers the only way out of our economic slough. Even the bankers seem to be joining the ranks, for Martin Dodge, representing the Second Federal Reserve District, recently broadcast his whole-hearted support of such a view. One of the most interesting bits of his talk was:

"Several misconceptions prevail regarding the constuction of public works as an aid in the present depression. For instance, it is said that no reasonable programme of public works could possibly supply jobs for the ten or twelve million persons now out of work, so why bother with it at all? No one contends, of course, that the government can supply jobs to ten or twelve million persons. It is equally true, however, that the government cannot permanently provide food, clothing, and shelter for these ten or twelve million persons and their dependents. The only genuine relief for the unemployed is re-employment by business and industry. Every plan of relief, therefore, should be tested on the basis of whether or not it contributes to economic recovery.

. . . "A third misconception is the belief that 'public works' means public works by the national government. The truth of the matter is that the bulk of public works construction has almost always been local or State, rather than national. Such projects as municipal water works, sewer systems, street and highway construction, bridges, tunnels, schools, and county and municipal buildings, constitute by far the largest percentage of all public works construction.

. . . "Can we afford it? Is it not inconsistent with present efforts toward tax reduction, economy, and retrenchment? These questions reflect a fourth misconception regarding public works as a means for stimulating business recovery. The answer here is that if we do not spend money in such a way as to provide employment we shall have to spend it for unemployment; that if economy means blind retrenchment it becomes extravagance; for instance, a wholesale suspension of public works, ostensibly to cut expenses, simply means transferring men from the employment roll to the relief roll, which costs money just the same but adds nothing to the public wealth and makes no contribution to business recovery."

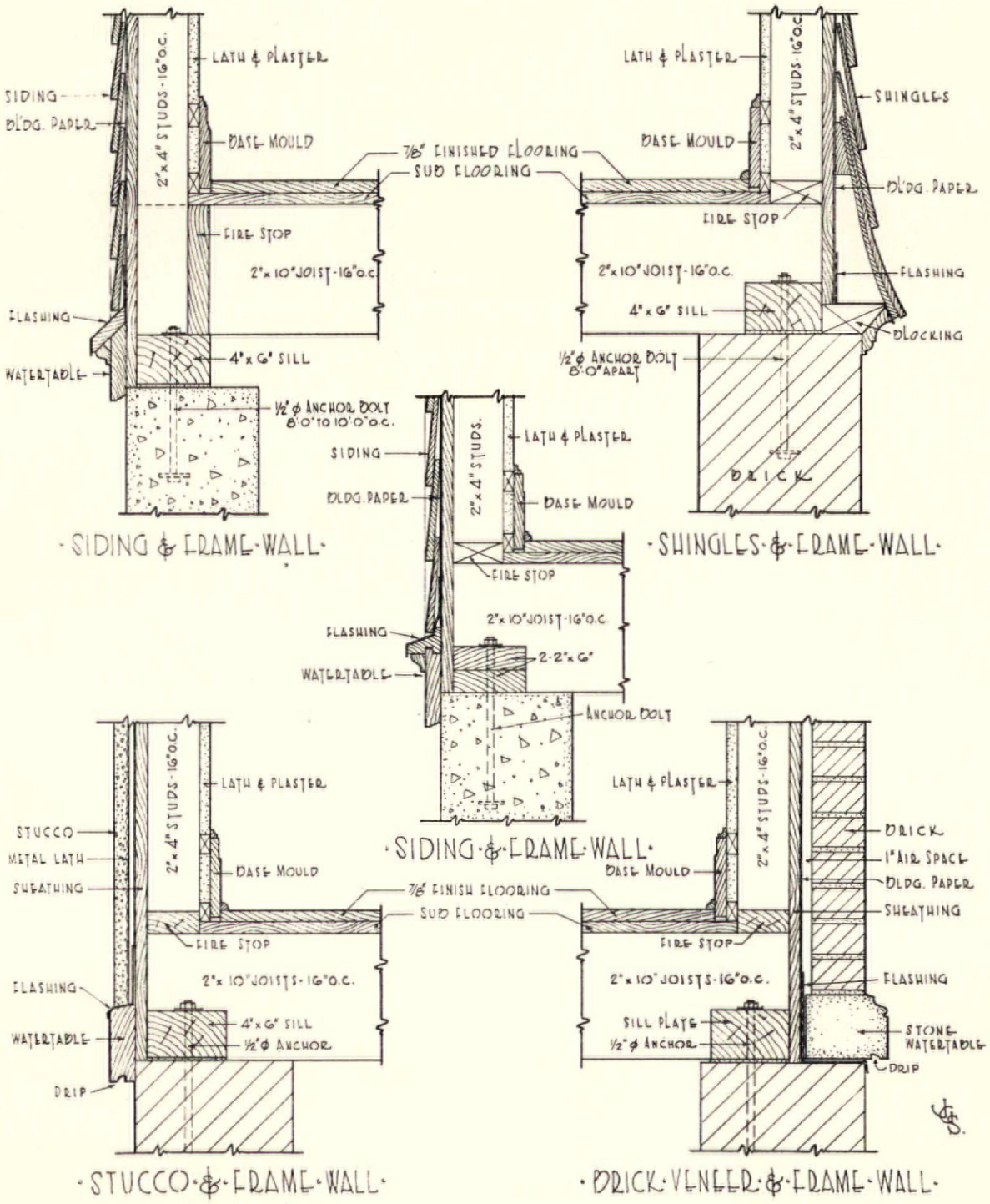
*Wednesday, March 1.*—James T. Grady, publicist for the A. I. A., joined the architectural editors at luncheon today, and told us something of the present status of the Institute's efforts toward new Federal legislation. With the change of administration and the strong possibility of a complete reorganization of the government bureaus, it would seem best to sit tight for the moment and await the new course in which the ship of state will be set.

*Thursday, March 2.*—Lunched with Milton Lowenstein, discussing possibilities in architectural education. It is interesting to speculate on what results would follow an architectural educational movement based on materials rather than on style. If the student were grounded upon the fundamentals of construction in all the varieties it has achieved throughout the ages, rather than grounded upon what various men did with these materials in the evolution of style, the education of an architect would seem to reach a more logical and rational development. If, instead of studying the history of style, a student were thoroughly grounded (including training in the actual handling of stone, timber, plaster, steel, etc.) in the way, for instance, the French use stone; the Scandinavian countries, timber; Holland, brickwork; and the United States, the steel skeleton, would not the chances for creative achievement be brighter? The Bauhaus, of course, has been attempting this, but it is still early to weigh the results.

*Friday, March 3.*—William Lawrence Bottomley heads a committee of the New York Chapter, A. I. A., and the Architectural League of New York, for the purpose of publishing a survey of great Georgian mansions in the United States, all built prior to 1830. The project, like so many other architectural activities these days, is designed to make work for some of the unemployed draftsmen. Among the houses to be included are the Gardner Ladd house, Portsmouth, N. H.; the Van Rensselaer house, Albany; Hyde Hall, Cooperstown, N. Y.; Mount Pleasant, Philadelphia; White Hall, Md.; Mount Vernon and Mount Airy in Virginia; and Drayton Hall on the Ashley River, S. C., some of which mansions are almost unknown to the profession.

*Saturday, March 4.*—Speaking of educational matters, there has just been formed a Joint Advisory Committee composed of representatives from the four leading architectural organizations, with the purpose of guiding young architects toward uniform professional preparation for the practice. The Joint Committee is headed by Charles C. Zantzinger, F. A. I. A., and includes Charles Butler, F. A. I. A.; Emery Stanford Hall and James M. White of the National Council of Architectural Registration Boards; William Emerson and Roy Childs Jones of the Association of Collegiate Schools of Architecture; Ely Jacques Kahn of the Beaux-Arts Institute of Design. The committee outlined a programme calling for a minimum of eleven years of study.

The chief fault found with the present method deals with the period between graduation from college and entrance upon individual practice. One great difficulty here is the lack of opportunity afforded most draftsmen to see the actual work in progress. Possibly a part-time arrangement might be put into




# VARIOUS RESIDENTIAL WATERTABLES

## A Series of Working Drawings by Jack G. Stewart

SCALE: 0 3" 6" 9" 1'-0"

PLATE No 36

effect by which the draftsman is paid for his hours in the office and allowed to visit construction work on the job and in the factory with greater freedom.

The eleven years' minimum training consists of four years of school or academy; four years of technical college work; three years of internship or directed practical experiment under an experienced preceptor. Practically all are agreed also that the four years of technical college work should be supplemented by two years of liberal arts or foreign travel, or both.

*Monday, March 6.*—New York is going about its business almost as usual this morning with the banks closed. Apparently the hoarding of currency is not the only sin of which we may be accused at the moment. The New York Public Library has been subjected to a run. More than thirteen million books were withdrawn in 1932—an increase of nearly 25 per cent since 1929. The run has attained such force that a 33⅓ per cent limit is placed upon withdrawals. Hereafter the tellers will pass out only two books at a time instead of the six formerly allowed.

*Wednesday, March 8.*—This lull in architectural activities gives us a splendid opportunity to put our house in order, particularly in one or two such unsatisfactory matters as bid-peddling. The plan formulated by Professor Eric T. Huddleston, of the University of New Hampshire, is more and more widely and favorably discussed. It provides that a general contractor's bid shall be in two parts—the first quoting a sum total for his own work and profits; the second containing a list of sub-contractors' bids, which the general contractor submits as making up the remainder of his total contract price. These sub-contractors' bids are sent to the architect shortly in advance of the opening of general bids. The general contractor, therefore, is selected on the basis of his own work and profits, and the sub-contractors are selected at their stated price from the entire list of those submitting bids, provided only that those chosen must have the approval of the general contractor with whom they are to work.

*Thursday, March 9.*—The Pittsburgh Chapter, A. I. A., has launched a well-mapped-out campaign to make an architectural survey of twenty-seven counties in Western Pennsylvania. The purpose is to locate buildings erected in this section before 1860 in so far as these buildings are important architecturally and historically, and to compile photographs, drawings, and information to be preserved in the collection of the Historical Society of Western Pennsylvania. Rody Patterson is Executive Secretary of the Survey, 1707 Koppers Building, Pittsburgh.

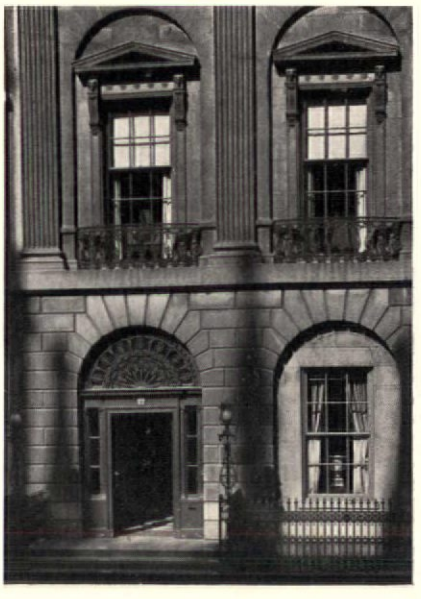
*Friday, March 10.*—Charles H. Higgins, president of the New York Chapter, A. I. A., was telling me the other day that Stanford White built a house for F. Knight Sturgis on East 51st Street, which, in the façade, very closely resembles a house that Robert Adam built for Sir Watkin Williams-Wynn at 20 St. James's Square, London. Sir Watkin's family happens to be in Higgins's direct line of descent. I went to see the Sturgis house today, and, through the courtesy of E. Harold L. Thompson of the Rosenbach Company, went through it from cellar to roof. The house was designed in all the dignity of the Brothers Adam style, though it seemed to me with a bit less restraint in some of the details than we would venture today. The plan varies considerably from the one in St. James's Square, in accordance with differing modes of living, but in the ceiling of the drawing-room on the third floor Stanford White used a true copy of one of the London house ceilings, excepting for its segmental ends. The elaborate wrought-iron stair railing in the New York house at first glance seems to duplicate the Adam original, but it turns out to be quite different in detail. The London house, too, I understand, is used by a dealer in antique furniture, and it may well be imagined that the stately rooms make an ideal background for eighteenth-century English furniture, silverware, and the like. Incidentally, the London house is rather well illustrated in Bolton's "The Architecture of Robert and James Adam."

*Sunday, March 12.*—I was interested to see that V. Gilmore Iden, director of public relations for the American Institute of Steel Construction, admits that efforts to build houses entirely of steel are unfortunate. This is setting a good example. In a speech before New Jersey masonry material dealers in January, Mr. Iden quoted Fred T. Llewellyn, consulting engineer of the United States Steel Corporation: "I conclude that the proper design of steel work in residences depends largely on materials other than steel. It depends upon the assistance of the enveloping materials." There has been entirely too much effort on the part of various industries to prove that one material alone is the best material with which to build our houses. More and more we are coming to see that the logical and economical solution will lie in an intricate combination of a number of materials.

*Monday, March 13.*—Alfred Githens, Thomas Ellett, and I discovered a rather interesting book in a club library today—a book that for some reason has apparently failed to achieve notice in any of the professional journals, so far as I know, possibly because it is in German. Its title is "Die Baukunst der Neuesten Zeit," an independent unit in an elaborate series of volumes under the general title of "Propylaen Kunstgeschichte." The series constitutes an encyclopædia of art, profusely illustrated. The volume that interested us most, however, is an attempt by Gustav Adolf Platz to summarize modern architecture in the twentieth century, tracing the growth of the so-called modern architecture from its rather innocent beginnings to the extremes of pseudo-functionalism.

*Tuesday, March 14.*—William G. Tachau and I listened to Frank Lloyd Wright speak before a large luncheon gathering, laying the bulk of the blame





*The house at 17 East 51st Street, New York, designed by McKim, Mead & White for F. Knight Sturgis, adapting Robert Adam's house for Sir Watkin Williams-Wynn at 20 St. James's Square, London*

for the architecture of the twentieth century at the door of our education, which he says is from the top down in eclecticism.

*Thursday, March 16.*—Reading Moholy-Nagy's "The New Vision," I have run across the following explanation of distortion in art. I quoted Chester H. Rowell in these pages recently as saying that a fundamental principle of painting these days seems to be that "if one can draw, he mustn't." Moholy-Nagy, who has been lecturing on art at the Bauhaus, explains why. "In our environment there are stereometrically exact objects: flasks, goblets, musical instruments, etc. But since they are all around us, nobody any longer experiences their beauty. So we must make the beauty of the exact clear by an artificial distortion leading to a conscious rectification (in the mind of the observer)."

So now you know.

Moholy-Nagy's explanation of sculpture and its development through the various phases of kinetics, volume secured through motion, and light as spatial projection, leads us still further into the maze of modern thought.

*Saturday, March 18.*—The National Archives Building now under construction in Washington is, from all accounts, a most unusual problem. The Office of John Russell Pope is designing it, with Clyde R. Place as consulting engineer on mechanical equipment. The building is to be five stories high, but will contain twenty-one tiers of stacks in which the documents and papers will be stored. The basement is to contain cleaning, repairing, and bindery spaces, photographic rooms, storage and mechanical equipment. The new science of air-conditioning here comes into play as a further safeguard against deterioration of the documents. There is to be about four million cubic feet of air-conditioned space. The cooling alone of this large volume of air requires refrigeration equivalent to the melting of one thousand tons of ice every twenty-four hours.

*Monday, March 20.*—Lunched with Lorimer Rich, discussing, for the most part, our national tendency to haste. Louisiana, I believe, is boasting of having built its State House in twelve months. Stockholm, on the other hand, built its Town Hall, and Ragnar Ostberg took fifteen years to do it. Building a State House in twelve months is a risky business at best. When one looks back over the buildings that satisfy us over long periods, one is apt to find that considerable time was expended in their making. The Boston Public Library was in the office of McKim, Mead & White for ten or twelve years. Henry Bacon spent almost ten years on the Lincoln Memorial. Nebraska is building a State House, too, but, instead of doing it in twelve months, has been at it for some twelve years, and the end is not yet. There seems to be considerable evidence, however, to the effect that when it is finished it will be worthy of the time spent upon it.

*Tuesday, March 21.*—Spent the evening with Kenneth Murchison, William F. Lamb, and two engineers—Leon S. Moisseiff and Edward A. Byrne—as a jury passing on the first stage of the American Institute of Steel Construction's Annual Students' Bridge Design Competition. There were one hundred thirty-four entries from architectural and engineering schools throughout the United States and Canada; from which we selected ten as worthy of further development by their authors in the final stage of the competition. I was interested to find that even in a subject connected so closely with engineering rather than architecture, the matter of scale proved to be a determining factor in the judgment. Too many students would throw across a gorge span of 250 feet a bridge structure that might have spanned Hell Gate or the Susquehanna River at its widest point. Then too, there seemed to be a great tendency—probably on the part of the architectural competitors chiefly—to display their knowledge of every engineering device ever utilized in bridge design, rather than to make a choice of the most suitable one for this particular problem.

*Wednesday, March 22.*—There is an exhibit of the New York Chapter's Apartment House awards covering the years 1910 to the present time, hanging in the main exhibition room at The League. It is an instructive picture of the road we have travelled in nearly a quarter of a century—from the heavy overhanging cornices and applied ornamentation to the sleek, businesslike apartments of recent years, such as Andrew Thomas's Dunbar Apartments, Clarence Stein's Phipps, and others. It is not altogether reassuring, architecturally, to find how illogical and comparatively futile our designs must have been, made twenty years ago, when one considers that these examples exhibited are the prize awards.



*Friday, March 24.*—William Sloane Coffin, one of whose jobs is the presidency of the Metropolitan Museum of Art, is somewhat concerned over the fact that nearly sixty thousand fewer persons visited the Museum during 1932 than in the previous year—the attendance falling from 1,334,317 to 1,274,672. It might be expected that in a period like the present, more people would have opportunity and leisure to visit the Museum. Mr. Coffin believes, however, that appreciation and enjoyment of art by the adult, as something to fall back upon in times of stress, seldom comes unless early education has provided a background. However, while the total number of visitors fell off, the number of persons coming to lectures, classes, and other museum work increased nearly twenty per cent. The attendance at public concerts given through the generosity of Mr. Edward Harkness, and a grant by the Juilliard Foundation, increased, which perhaps may be explained by the fact that more people find it easier to enjoy music than to enjoy painting or sculpture.

*Sunday, March 25.*—Gordon Simpson in from the Pacific Coast with word that building activities are rather more marked out there than in the East, due partly to the earthquake. The Pacific Coast more and more seems to be growing to be a little world of its own, rather more self-contained, I imagine, than the East. Here our dependence upon the activities among other peoples abroad and the intricacies of international relationships are unquestionably growing more acute. The Pacific Coast, on the other hand, seems to worry along fairly well under its own power.

*Tuesday, March 28.*—Douglas Haskell in with some news of Henry Wright's findings abroad. Wright, in studying modern housing in England and on the Continent, finds a great deal of confirmation for some of the latest conclusions his study has brought out in connection with American housing. Wright is always about two jumps ahead of the prevailing accepted thought regarding housing, and he has just taken another stride. One of the handicaps in our housing has been the tacit assumption that a housing group should be a repetition of one or two sizes of unit. This is not in accordance with our needs, nor Wright's feeling that the family units in any community are very diverse and that their housing should correspond. It is too common practice for young people in a family, for example, when they marry, to have to move to a distant community for accommodations on a smaller scale, thereby straining all ties of family and friends. Through ingenious planning, Wright has arrived at a scheme by which a housing group can provide variety of space on the flat or on two floors, each unit with its individual entrance without the necessity for janitor service, elevators, or other expensive accompaniments of community life. The development of individual heating, hot-water supply, refrigeration, and incineration is likely to bring a new and more workable type of community housing which, for the first time, is adapted to man's needs rather than forcing man with his diverse needs into a Procrustes bed.

THE SEVENTY-NINTH IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

# ARCHITECTURE'S PORTFOLIO OF

# THE EAGLE IN SCULPTURE

*Subjects of previous portfolios are listed below at left and right of page*



1926
- DORMER WINDOWS
- SHUTTERS AND BLINDS

1927
- ENGLISH PANELLING
- GEORGIAN STAIRWAYS
- STONE MASONRY TEXTURES
- ENGLISH CHIMNEYS
- FANLIGHTS AND OVERDOORS
- TEXTURES OF BRICKWORK
- IRON RAILINGS
- DOOR HARDWARE
- PALLADIAN MOTIVES
- GABLE ENDS
- COLONIAL TOP-RAILINGS
- CIRCULAR AND OVAL WINDOWS

1928
- BUILT-IN BOOKCASES
- CHIMNEY TOPS
- DOOR HOODS
- BAY WINDOWS
- CUPOLAS
- GARDEN GATES
- STAIR ENDS
- BALCONIES
- GARDEN WALLS
- ARCADES
- PLASTER CEILINGS
- CORNICES OF WOOD

1929
- DOORWAY LIGHTING
- ENGLISH FIREPLACES
- GATE-POST TOPS
- GARDEN STEPS
- RAIN LEADER HEADS
- GARDEN POOLS
- QUOINS
- INTERIOR PAVING
- BELT COURSES
- KEYSTONES
- AIDS TO FENESTRATION
- BALUSTRADES

*Below are the subjects of forthcoming Portfolios*

Eaves Returns on Masonry Gables
JUNE

Exterior Lettering
JULY

Entrance Driveways
AUGUST

Corbels
SEPTEMBER

Pew Ends
OCTOBER

Gothic Niches
NOVEMBER

*Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up about six weeks in advance of publication date.*

1930
- SPANDRELS
- CHANCEL FURNITURE
- BUSINESS BUILDING ENTRANCES
- GARDEN SHELTERS
- ELEVATOR DOORS
- ENTRANCE PORCHES
- PATIOS
- TREILLAGE
- FLAGPOLE HOLDERS
- CASEMENT WINDOWS
- FENCES OF WOOD
- GOTHIC DOORWAYS

1931
- BANKING-ROOM CHECK DESKS
- SECOND-STORY PORCHES
- TOWER CLOCKS
- ALTARS
- GARAGE DOORS
- MAIL-CHUTE BOXES
- WEATHER-VANES
- BANK ENTRANCES
- URNS
- WINDOW GRILLES
- CHINA CUPBOARDS
- PARAPETS

1932
- RADIATOR ENCLOSURES
- INTERIOR CLOCKS
- OUTSIDE STAIRWAYS
- LEADED GLASS MEDALLIONS
- EXTERIOR DOORS OF WOOD
- METAL FENCES
- HANGING SIGNS
- WOOD CEILINGS
- MARQUISES
- WALL SHEATHING
- FRENCH STONEWORK
- OVER-MANTEL TREATMENTS

1933
- BANK SCREENS
- INTERIOR DOORS
- METAL STAIR RAILINGS
- VERANDAS



*Masonic Temple Building, Ansonia, Conn.* © Amemya
*Douglas Orr*



*For Farmington School, Farmington, Conn.*
*Lee Lawrie*

*Aluminum, Federal Reserve Bank, Pittsburgh*
*Henry Hering*



*Cast lead, Fort Jay, Governor's Island, N. Y.*
*Enea Biafora* *Rodgers & Poor*





*For Pasadena Memorial Flagstaff*
*Lee Lawrie*



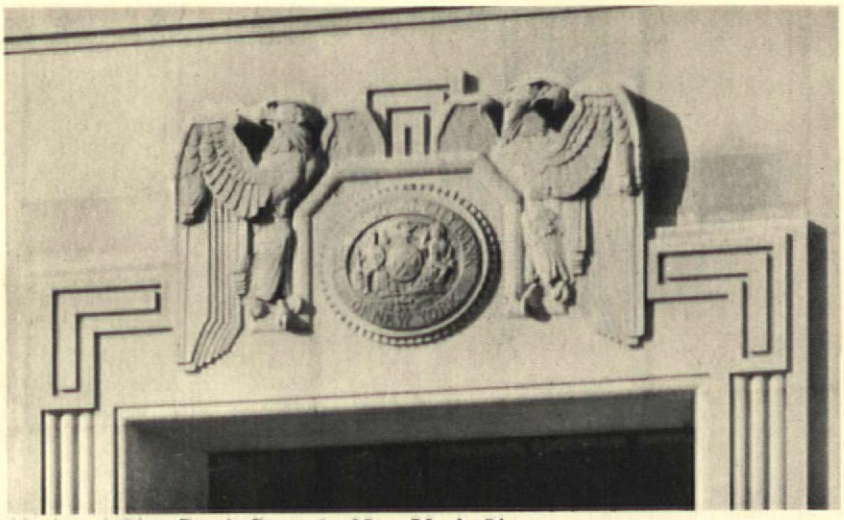
*First National Bank, Azuza, Calif.*
*Robert Orr*

*Pylon, Philadelphia Civil War Memorial*
*Hermon A. MacNeil*




*Nebraska State Capitol, Lincoln*
*Lee Lawrie*
*Bertram G. Goodhue Associates*





*National City Bank Branch, New York City*
*Walker & Gillette*



*Whitinsville (Mass.) Monument*
*Hermon A. MacNeil*




*International Mercantile Marine Building, New York City*
*Walter B. Chambers*

*University of Chicago Chapel*
*Ulric H. Ellerhusen*
*Bertram G. Goodhue Associates*



*For wood carving*
*Hazel Clere*





*Polished aluminum,*
*Hartford (Conn.) Post Office*
*Malmfeldt, Adams & Prentice*

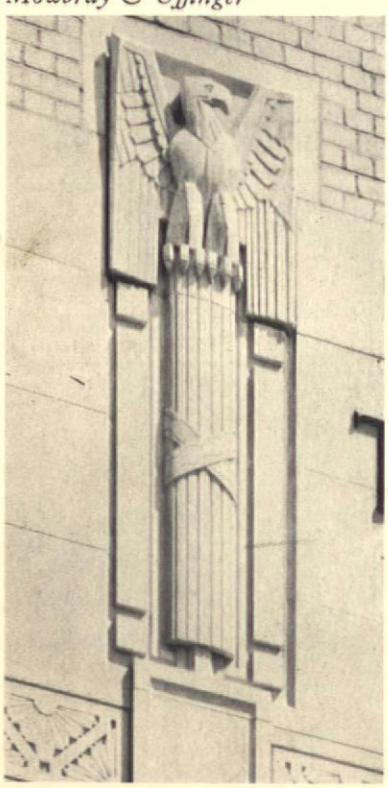


*Federal Reserve Bank, Minneapolis*
*Cass Gilbert*

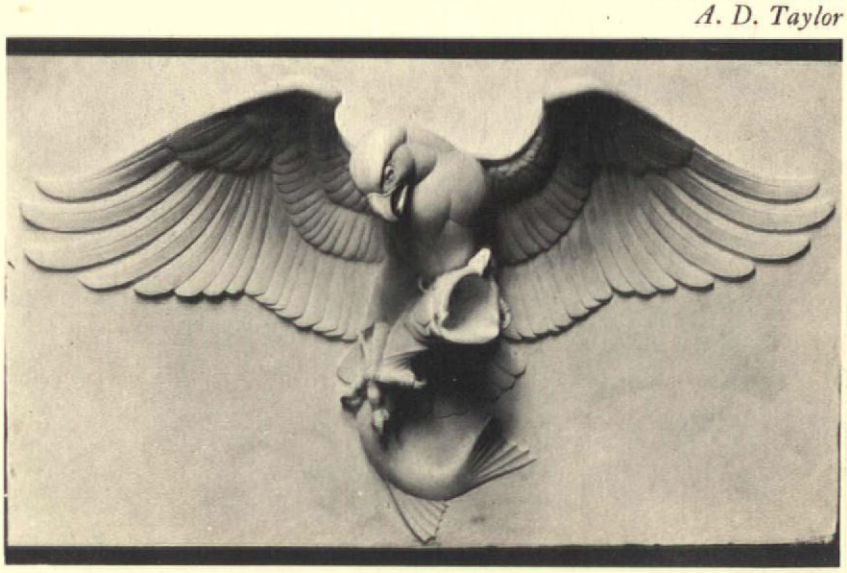



*First National Bank, Hamilton, O.*
*Childs & Smith*

*Bloomfield (N. J.) Bank*
*Mowbray & Uffinger*

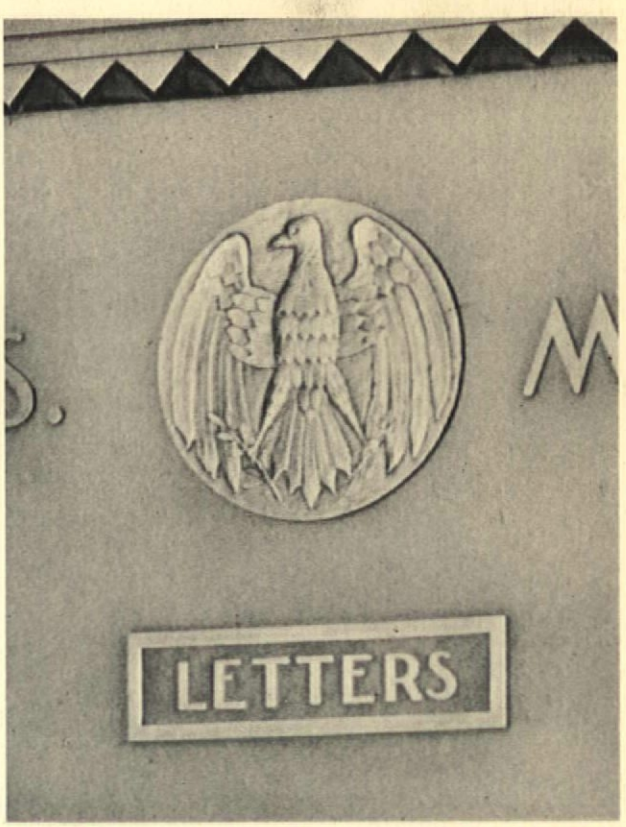


*Wall fountain, Fleischman Estate, Cincinnati, O.*
*Edmond Amateis*
*A. D. Taylor*






*Bricken Textile Building, New York City*
*The Firm of Ely Jacques Kahn*



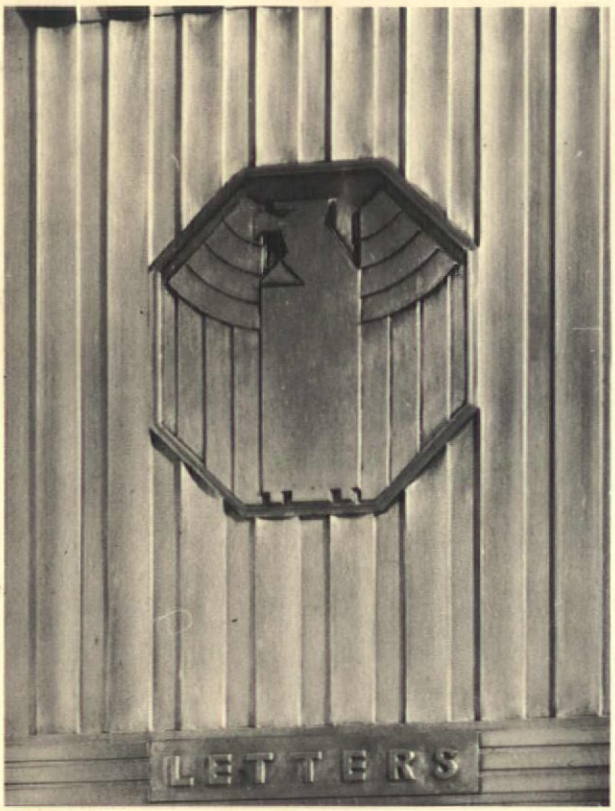

*Office of Brown Brothers & Company, New York City*
*Delano & Aldrich*

*National Newark (N. J.) Building*
*John H. and Wilson C. Ely*

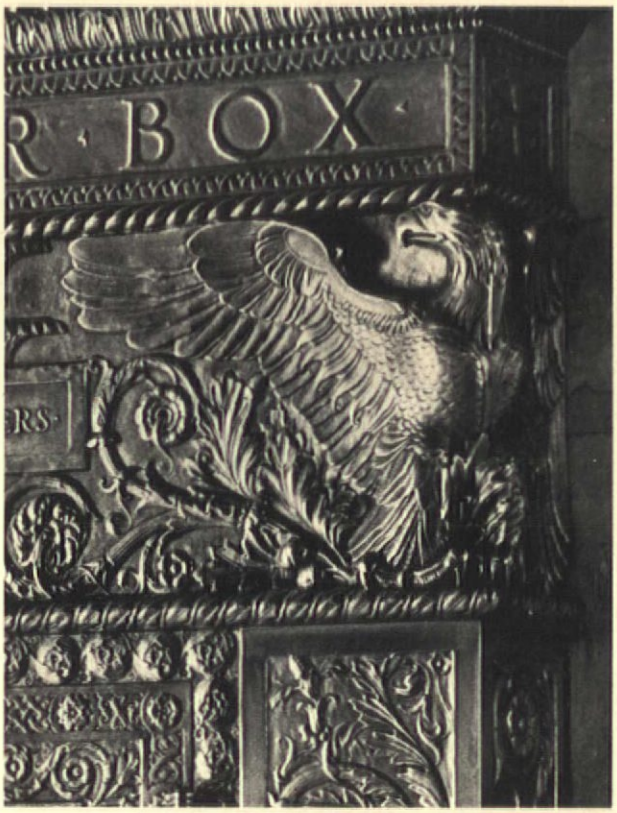


*Chrysler Building, New York City*
*William Van Alen*






*Squibb Building, New York City*
*The Firm of Ely Jacques Kahn*




*Pershing Square Building, New York City*
*York & Sawyer*

*19 Rector Street, New York City*
*Lafayette A. Goldstone*




*Bauer Building, Los Angeles*
*John and Donald Parkinson*





*Thomas Redfield Proctor Memorial, Utica, N. Y.*
*Charles Keck*



*Pennsylvania Railroad Terminal,*
*New York City*
*Adolph A. Weinman*
*McKim, Mead*
*& White*



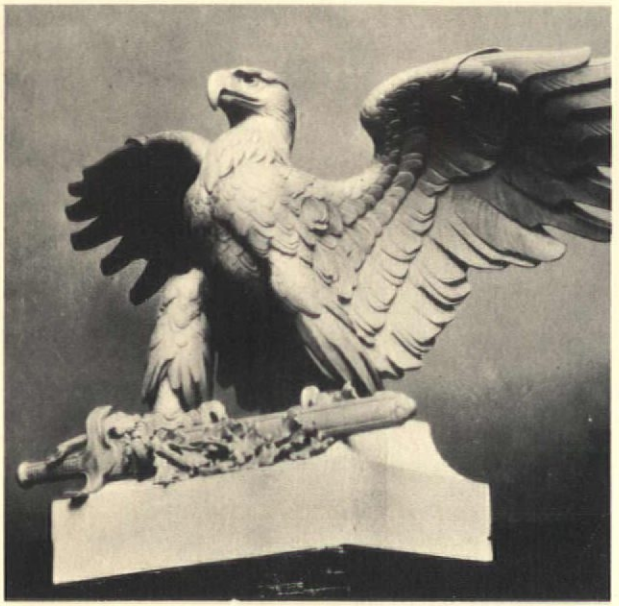

*A. I. A. Gold Medal*
*Adolph A. Weinman*

*"Son of the Eagle"*
*A. Stirling Calder*



*District*
*of Columbia*
*War Memorial*
*Frederick H. Brooke*





*Pottstown (Pa.)*
*War Memorial*
*Adolph A. Weinman*



*Ridgewood (N. J.) War Memorial*
*Henry Hering* *Henry Bacon*



*United States Soldier's Medal*
*Gaetano Cecere*

*Guild Hall, East Hampton, L. I.*
*Aymar Embury II*



*Dominion*
*Bank,*
*Toronto*
*John M. Lyle*





*Federal Reserve Bank, Cleveland, O.*
*Henry Hering*
*Walker & Weeks*



*West Virginia State Capitol, Charleston*
*Cass Gilbert*

*Pennsylvania Railroad Terminal, New York City*
*Adolph A. Weinman*
*McKim, Mead & White*





*Maricopa County Court House,*
*Phoenix, Ariz.*
*Edward F. Neild*

*New Britain (Conn.)*
*War Memorial*
*H. Van Buren Magonigle*

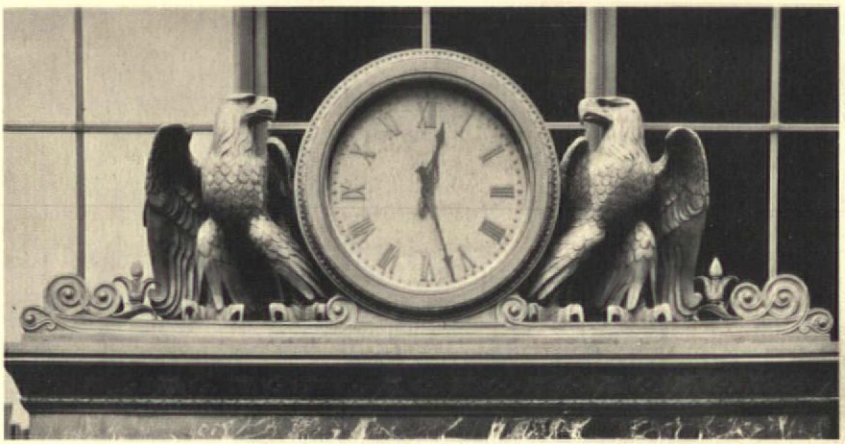




*Aluminum,*
*Clarksburg (West Va.) Bank*
*Henry Hering*
*Walker & Weeks*



*Union Center (N. J.) National Bank*
*Frederick A. Elsasser*

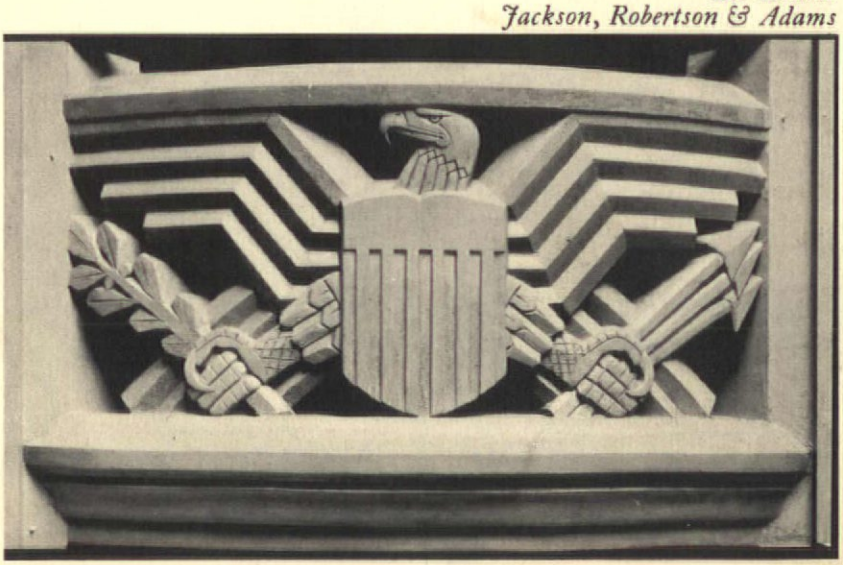


*Bank of the United States Branch, New York City*

*American Bank*
*& Trust Company,*
*New Orleans*
*Moise H. Goldstein*



*Cornell Law School*
*Lee Lawrie*
*Jackson, Robertson & Adams*





*United States Embassy, Paris*
*C. Paul Jennewein*
*Delano & Aldrich*



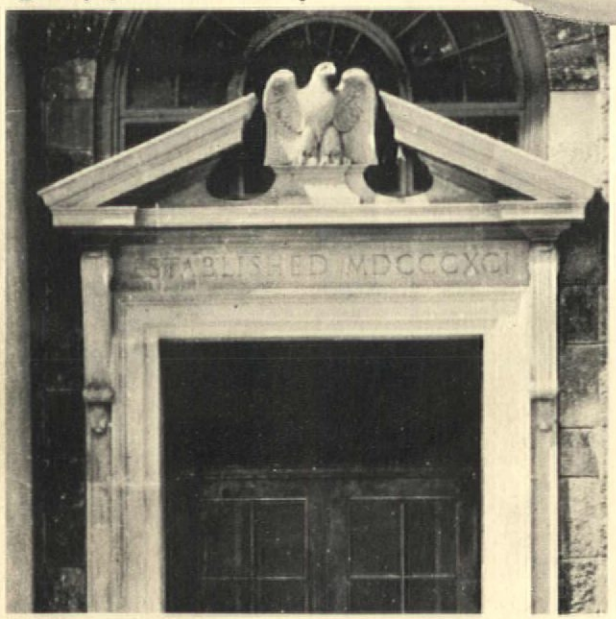
*Scottish Rite Temple, Washington, D. C.*
*Adolph A. Weinman*
*Office of John Russell Pope*



*Plaza Trust Company,*
*New York City*

*Corbett, Harrison*
*& McMurray*

*First National Bank,*
*Mamaroneck, N. Y.*
*Office of John Russell Pope*



*Los Angeles Library*
*Lee Lawrie*
*Bertram G. Goodhue*
*Carleton M. Winslow*

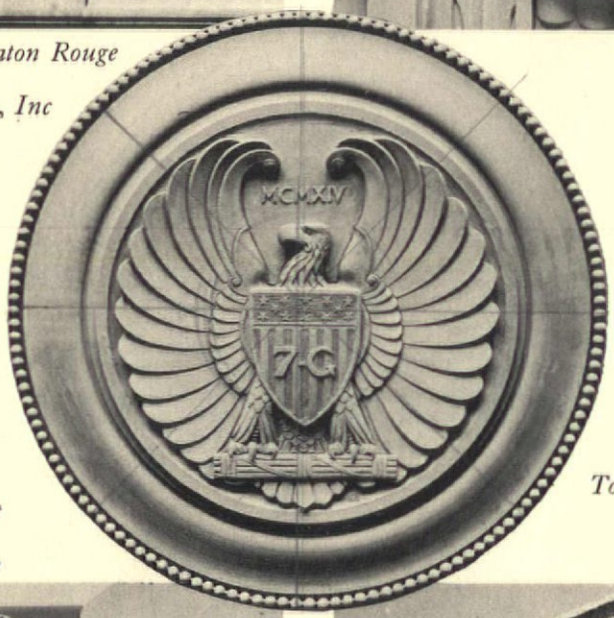




*Louisiana State Capitol, Baton Rouge*
*Lee Lawrie*
*Weiss, Dreyfous & Seiferth, Inc*



*Bankers Trust Building,*
*New York City*
*John De Cesare*
*Shreve, Lamb & Harmon*




*Federal Reserve Bank,*
*Chicago*
*Henry Hering*
*Graham, Anderson,*
*Probst & White*

*Cadet Barracks, West Point*
*Lee Lawrie*
*Cram, Goodhue & Ferguson*

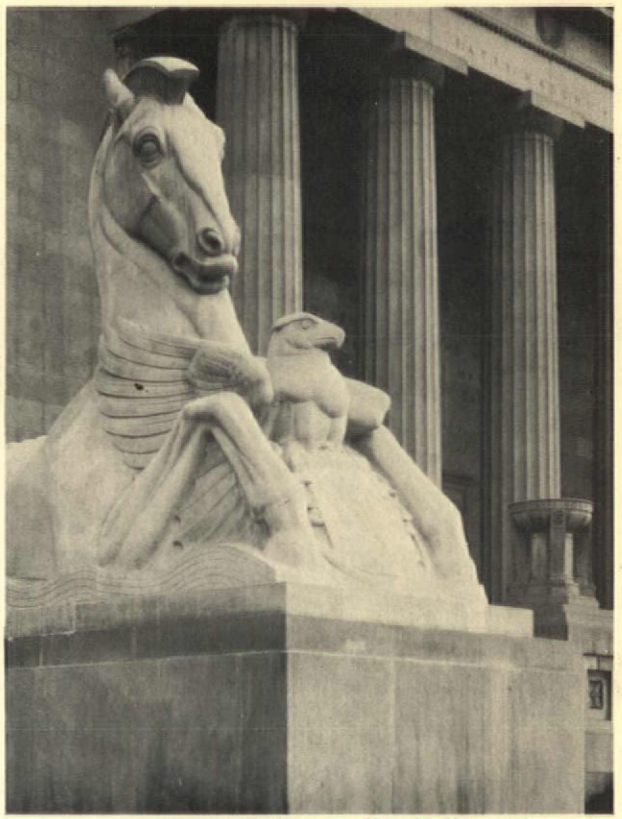



*Approach,*
*Tomb of the Unknown Soldier,*
*Arlington, Va.*
*Thomas Hudson Jones*
*Lorimer Rich*



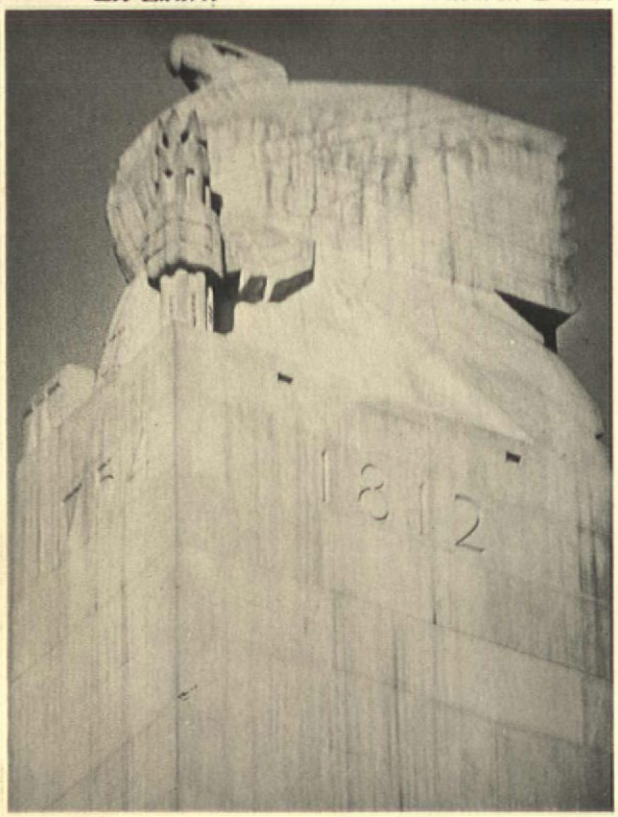


*Church of the Transfiguration of our Lord, Philadelphia*
*Henry D. Dagit & Sons*



*Baltimore World War Memorial*
*Edmond Amateis*
*Laurence Hall Fowler*

*Pylon top, Harrisburg (Pa.) Memorial Bridge*
*Lee Lawrie*



*Portland (Ore.) Post Office*
*Lewis P. Hobart*





*For flagpole top, West Virginia State Capitol, Charleston* *Cass Gilbert*



*East New York Savings Bank, Brooklyn* *Holmes & Winslow*

*Portland (Ore.) Post Office* *Lewis P. Hobart*

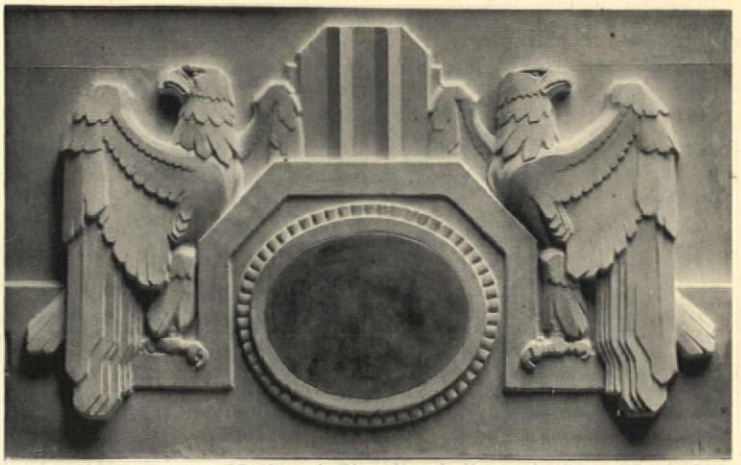


*National City Company Building, New York City* *McKim, Mead & White*





*Louisiana State Capitol, Baton Rouge*
*Lee Lawrie*
*Weiss, Dreyfous & Seiferth, Inc.*



*National City Bank Branch, New York City*
*Ulric H. Ellerhusen*

*Below, Glen Cove (N. Y.) Post Office*



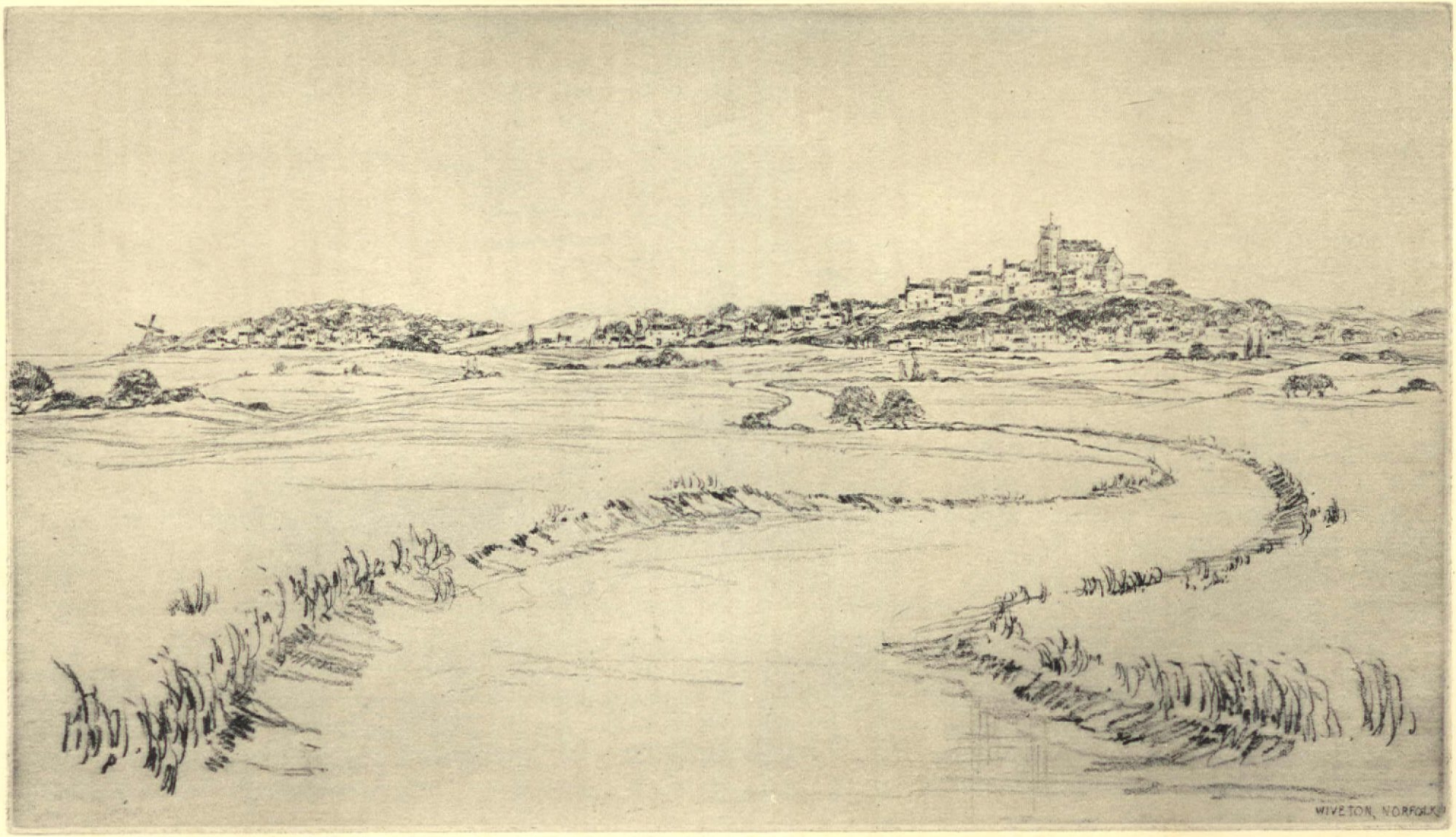
*Hazel Clere*
*Supervising Architect of the Treasury;*
*Delano & Aldrich*

*Empire State Building, New York City*
*John De Cesare*
*Shreve, Lamb & Harmon*



*Bank of Nova Scotia, Halifax*
*John M. Lyle*






*By courtesy of Kennedy & Company*

*INLAND ISLANDS.* *Soft-ground etching by Gerald K. Geerlings*

Size of original, 6⅜ by 11¼ inches. See article on page 333

ARCHITECTURE

VOLUME LXVII JUNE 1933 NUMBER 6

# Are We Ready for an American Housing Advance?

*By Henry Wright*

A SUMMARY, such as was given in my first article ("The Sad Story of American Housing," April ARCHITECTURE), would seem conclusive evidence against the possibility of achieving decent housing standards through regular real-estate practice. At the end of forty years we find both the planning and the construction more wretched, if possible, than they were before, so that the movement from 1911 to 1931 is not forward but backward. The promise for the future lies in a different concept, that of the large, responsible operating company that undertakes the whole project in one continuous procedure, from acquiring and subdividing the land to planning the details of the individual dwelling and managing either the purchase or the operation for the occupants.

There is one preliminary condition to be fulfilled before the architect will be able to proceed in this direction of group planning and group dwellings at all. This condition is relief from the incubus of pre-ownership of the land. Unless this pre-ownership is removed, no progress can be made, and it is scarcely worth while to discuss any form of improvement in American housing. What is meant by pre-ownership of the land? Not home ownership. Not productive ownership in any form, but simply the subdivision and holding of lots long before there is any conceivable need for them, and then their sale to scattered individuals in a manner that makes it thenceforth impossible for any responsible agency to secure any large-scale control.

Once released from pre-ownership, technical competence would have an opportunity to function. First of all, the responsible agencies, planning with human needs in view, would recognize technical gains and encourage them; and secondly, the technician himself would acquire the facility and understanding that come only with long study and repeated practice.

Whether housing should then become a social function is another question. Whatever the motives that produced it: whether personal enjoyment in the enterprise, social magnanimity, or business gain, the technical competence would nevertheless be in demand. And it is inconceivable that with new processes in action, the movement would not spread, city planning and housing knitting themselves together, so that considerable areas could be organized, with their streets, public improvements, access, and other city-planning factors coordinated to the new building technique.

Now at precisely this point it is necessary to pause. We cannot assume offhand that our present group forms are the correct and settled basis for progress. We scarcely appreciate the extent to which the basic individual dwelling types we have provided within the group, even in advanced experiments such as Sunnyside, fall below the possible standard of quality. The planners have always had to reckon with the general state of non-appreciation on the part of the expected users—a limitation particularly restrictive when the product was for purchase. The chief advance that could be made in a project such as Sunnyside was, first, in the organization of "two-room-deep" space, and second, in group organization.

Out of our practice to date, then, we have acquired a small set of what we think are universally valid principles. These can be presented more extensively in a book, and can only be listed here. First is the principle of the *row*, which saves land, and permits cheaper and more efficient construction both by virtue of continuous processes and the elimination of one wall. Next is the *broad front*, which secures sunlight

exposure, interior circulation and ventilation, particularly in conjunction with *two-room-deep planning*. Now when it comes to fitting these principles to specific dwelling plans, suited to the needs of individual families, the problems are far more complicated. How do people like to live? How can they live most conveniently? What are their real needs? To these questions our answers have mainly been wholesale assumptions. And it is not only in the United States that this has been true, but, as I shall be at pains to point out, also in the far more widely spread operations in England and Germany. Where a satisfactory solution would seem to call for the greatest variety of accommodations, too heavy a reliance has been put on what must be called stock plans.

Before going into greater detail, it may be well to recall whence some of these assumptions about people's living habits derive. We are all of us accustomed to thinking in terms of certain labels: we think of "houses" (whether free or attached), we think of "flats," or of "apartments." Into each of these types our mind's eye places a certain kind of family—thus the family in the "house" has a lot of children, and the couple in the apartment has none—and we plan to continue the assumed living habits of these people with as little disturbance as we can. Meanwhile, even a natural evolution, unguided, would tend to shuffle all these types of domicile, each with its different advantages, and reassort the elements in a quite unprecedented fashion.

What has occurred in the various countries can be noted only in the briefest review, by no means doing justice to unquestioned achievements. In each country the chief basis of postwar advance has been the principle of two-room-deep planning. Only the United States has been behind, with a mere handful of examples. England centred on the perfection of the row-house, to build, under the guidance of the Ministry of Health, many hundreds of organized communities all very much alike in general concept and varying only in group detail and in the size of the houses. Orientation study in many instances brought about variations in the stock plans for opposite sides of the street, particularly where exposures were north and south. For the most part, however, the main effort in the planning was confined to placing the living-room on the garden side. The development was carried to an extreme of large hollow blocks with cul-de-sac injections. There was no such universal adjustment in the direction of the row units with respect to the sun as in Germany. In England, as elsewhere, plans were based upon fairly rigid assumptions as to how people would occupy the house. They were left to fit themselves into what the architect had predetermined, and all in a pattern fairly uniform.

In Germany during 1925–1931 there was an even larger movement toward new community building, which supplied almost every industrial community with new housing units. The fact of the "modern" style is important here only insofar as the freedom and experimentation in form were accompanied by new thought and freedom in planning detail. The community-planning movements of both Germany and Holland are of the utmost importance as a demonstration of the civic and social values arising from orderly communities. The new is of course in the most striking contrast to the old. This organization of community development should receive the most careful study (and is taken up elsewhere), but for our present purposes let us consider not its credits but its limitations.

As in other countries, the plan details in Germany have been divided into two categories. First, there is the single-family row house. This is of either two or, more frequently, three stories, with one bedroom and the laundry usually placed in the attic. Such a type follows the old traditions of living. The other type is a definite concession to new needs and emergent ways of living, for which the appropriate form is assumed to consist of some sort of apartment. Frequently in the same community different architects will be assigned different sectors, each designer putting up two or three rows repeating the identical plan unit throughout. The community plan as a whole, developed by some one of the architects, results from an orderly disposition of these group units in relation to a special street plan. In its larger elements the grouping takes its character from the relative disposition of the row house and the apartment units.

Thus in any particular plan we shall almost always find part of the community made up of row dwelling units two and one-half stories high, and row apartments four stories high (although the apartment height has recently tended toward only three). There may or may not be a storage attic, which may cover either the whole building or only the front half. So, without discussing the design problems that have determined this form of planning, we find in the



*Part of the great horseshoe apartment group in the Siedlung Britz, of which the Brothers Taut and Hoffmann were the architects. A plan of the group is shown on page 313*

results the following more or less rigid and hampering limitations:

(*a*) The assumption with respect to people's prejudices that has led to the provision of just two classes of dwelling space of widely separate origin.

(*b*) The assumption that those wanting large accommodations want them in the form of houses with gardens, while others will want apartments of relatively small capacity and often without gardens. (An excellent exception in respect to gardens is found at Britz, Berlin, where a convenient and fair-sized garden is provided for every apartment in a set of three-story structures.)

(*c*) The segregation of these basic types in different areas, the taller often surrounding the lower buildings.

(*d*) Large units, or numbers of units, or sometimes whole projects, held to one standard apartment plan.

To this there might be added that behind the impressive novelty of these flat-roofed exteriors is concealed an anomalous admixture of elements old and new in the interior equipment.

Possibly the limitations were inherent in a period of advance when technical skill was concentrated upon problems of universal application, such as good orientation for every occupant. Using what they had learned, the designers faced a sufficiently complicated problem in securing community balance and a pleasing artistic use of the constant repetitive external elements. There was a fine spirit of democracy, or socialism if you will, in securing an equal share for every one in the sunlight and the green of the garden. Yet, this much once accomplished, the claims of diversity in the human family, even upon the most democratic basis, urge themselves anew.

Before leaving German housing, we might call attention to the more recent theoretic studies of the German architects, including those of the Bauhaus. They seemingly result in a community organization even more rigid and monotonous than heretofore (and my own observation leads me to believe that this mania for universal exposure loses more in other living qualities than it gains in its one acknowledged aim), but there are other very promising aspects. There are plan studies, for example, that start from a fixed stair and bathroom position, and permit

a variety of adjustment in rooms, both in number and use, in both vertical and horizontal grouping. There are also extensive studies of fenestration bearing upon internal effectiveness of light and ventilation. All these studies will permit more freedom to the designer when once more he begins thinking of human needs and better ways of life rather than organized façades or balanced grouping. It is reasonable to assume that nothing need be lost for design if the human needs are met by those technically competent.

In the few experiments that have been made in the United States there has been the same tendency to constrict variety while concentrating on the more elementary general problems. The war housing communities, of special merit, were based upon a development of the Philadelphia row house. The long Philadelphia rows were broken into short groups, with studied and sometimes successful group interest. Yet the plan was still based upon the repetition of one or two typical plans little different from the few "broad-front" plans then in use. Community groupings of note may be seen in Yorkship Village, where more than half the houses are of an identical five-room plan, or at Buckman Village, Chester, and Sun Hill, Chester, where row houses were effectively handled on a hillside site. Exceptions to this rule of limited-scale repetition were made at Seaside Village, Bridgeport, where buildings of one and a half and of two stories were varied internally to serve for one or for two families and were intermingled in a successful mass design; and more especially at Newburg, N. Y. Here the architectural composition grew out of a more related juxtaposition, in which there figured single-family houses, semi-detached and row houses, and apartments of two sizes and plan variations. All these were designed in response to a predetermined spread in demand. Quantities of accommodations were built in sizes and kinds elsewhere not provided at all.

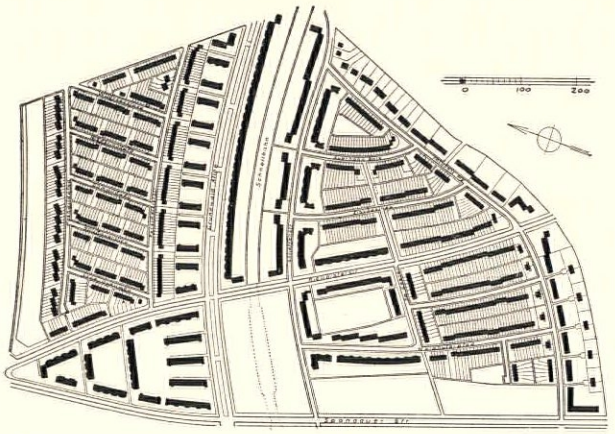
Mariemont, Ohio, straddled the problem. One corner of the community plan was to be taken up by row and two-family houses, variety being secured in these by employing a large number of architects; the town centre was laid out in apartments; all the rest of the town, in short the most of it, was devoted to lots with extravagant costs of street frontage and of heating from a central plant. These were to be built upon by individual owners under compulsory architectural guidance.

Sunnyside was the outgrowth of the war experience and of the study its planners had devoted to English practice. It was limited by the directing concept of holding to housing types that were known and were more or less current in the neighborhood. The structures were held to a uniform two-room depth. The street blocks were of the New York narrow width but unusually long. Because of the length, the house rows were broken down into groups of from four to seven units. Removal of the garages from the centre of the block created a garden and at the same time permitted erection of enough additional structures to pay for the space occupied by the garages elsewhere. In the first units the community composition was effected by juxtaposing symmetrical units, made up respectively of two-story two-family houses, three-story apartments, and one group of two-story single-family row houses. In later years the planning became standardized upon the basis of individual groupings, consisting of a row of single-family houses flanked at one end by a double two-family unit and at the other concluded by a three-family unit of two stories that projected inward into the garden. This last sort of structure was provided for the double purpose of permitting some variation in apartment size and semi-dividing the garden into two or three more intimate small courts.

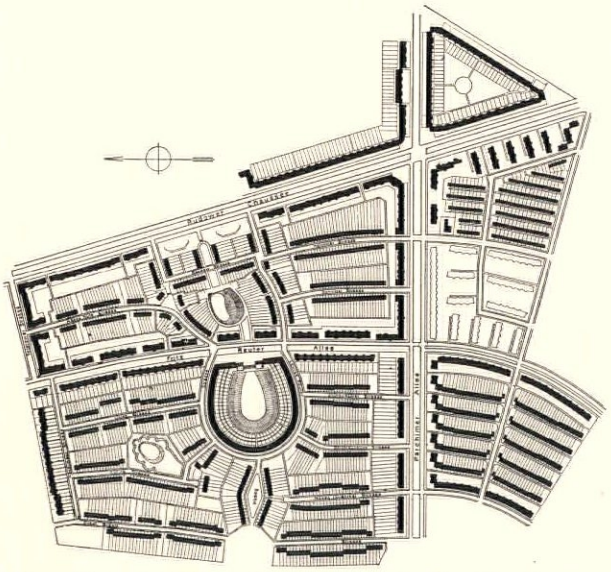
This early Sunnyside experience had in it at least the germ of plan variation for divergent human needs rather than for stereotyped technical assumptions. Certain factors limited its effectiveness. The inadequacy of the kind of cost accounting in use by everyone at the time misled the designers into accepting too restricted a plan area and particularly too narrow a frontage width. Hence over a four-year period there were repeated some 300 identical houses —identically deficient in dining-rooms and with an almost useless third bedroom. In all plans used, the well-known tendency of architects toward an overstudied plan compactness was also a limiting factor.

At Radburn the same architects were engaged in the very stimulating innovation of reversing the house front. This was done to meet very human requirements, but again the results were limited by the assumption that people would insist on an old concept of a house in a

new dress. And the new block form, perhaps too well known to require exposition here, was also unfortunately limited by overemphasis on symmetry or balanced planning on an axis. The result is an orientation not always ideal. What tendency toward diversification had begun at Sunnyside was arrested by the assumption, correct on its own premises, that it would be unwise to mix single-family houses with two-family ones owned by one of the occupants. The two-family houses remained in company ownership and were segregated, and this segregation weakened the advance that was made in their design and their arrangement as repetitive but architecturally varied groups.



*Plot plan of the Siedlung Zehlendorf, located in one of the better residential suburbs of Berlin. The Brothers Taut and Hoffmann, architects*



*Plan of the Siedlung Britz in a suburb of Berlin near Neukoln and the southeast industrial area. The horseshoe represents the three-story apartment group, around which are the low houses with their individual gardens. The Brothers Taut and Hoffmann, architects*



*A detail in the horseshoe at Britz which makes clear the appearance of terraced gardens, one for each apartment. The Brothers Taut and Hoffmann, architects*

Here, then, are three different countries, and in all three of them the existing housing of even the most advanced type is limited and obstructed in its free evolution. In none of the countries is there the diversification that modern occupants would have a right to expect on the basis of their needs. And the limitation was in part the result of the very progress that was made through the application of technical thought. To have achieved release from the lot crowding and the idiotic house organization that were described in the last article was in itself no mean achievement. And yet technical advance has been arrested because the technician ascribed to the public an exaggerated love for existing dwelling types as he himself classified them: the single-family houses, the flats, and the apartments of the past; and he believed that the public would insist upon their perpetuation. Advance was arrested, again, because of certain cost assumptions. It was believed, for example, that savings must be achieved by means of small rooms and narrow fronts. There was also as yet only a partial de-

velopment of automatic service facilities—new heaters, refrigerators, and the like—which make it possible both to arrange dwellings in groups and leave individual control without the usual onus.

Now it would be most unfortunate to distract the attention of American students from the great importance and excellence of the English, Dutch, and German advance, or from what limited progress we have made at home. The value of the two-room-deep standard cannot be overstressed. And yet, to digest the European work of the last ten years so thoroughly as to make our own projects completely in its image would be a most unfortunate thing. We should be fully aware of the Europeans and build upon their experience; however, there are certain advantages we ourselves possess, once we get rid of pre-ownership of the land, that are unique and not to be spurned. For one thing, the American public has been permeated with the consciousness of apartment-type living to an extent that has broken down old, long-established prejudices. Add as another factor our great capacity in construction, hitherto concentrated on the skyscraper, and our new structural techniques, already rapidly developing; add also our unique advances in the direction of automatic services, and, with half a chance, American technical ability should carry us far beyond the excellence of any existing results. We could place America as the "leader" instead of the "lagger" in the whole housing world.

It is upon this foundation that I have envisioned a new and far-reaching organization of American housing. It occupies the second section of my forthcoming book, the section devoted to "Group Housing." Here, then, is a summary, or credo: I believe

(*a*) That the apartment-house development in America has been actually of much less consequence and permanency than its spectacular nature might lead us to assume.

(*b*) That its original impetus is greatly weakened by the fact that the convenience once inherent in the apartment can now be attained in other and better ways.

(*c*) That the apartment house is a less natural and logical outgrowth of our widespread cities and our ample space than some intermediate form of housing, less ponderous and less burdened by centralized service facilities that are privately maintained for profit.

(*d*) That our new structural techniques and our automatic facilities make possible the provision of forms other than apartments that meet city conditions both in areas to be reconstructed and in new areas where individual detached houses cannot actually and permanently be maintained.

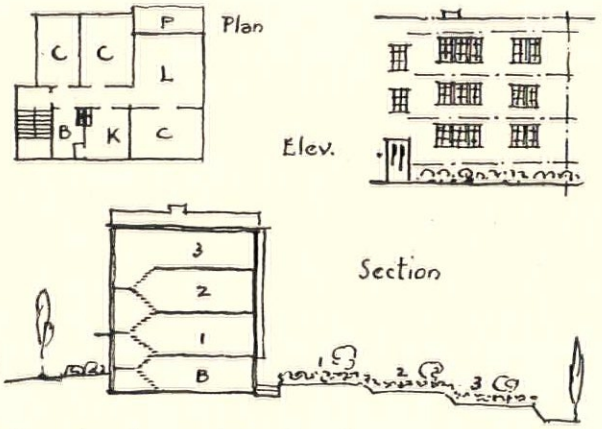
(*e*) That the past advances in improved row dwellings and small multi-family units give us the basis upon which, aided by the emerging facilities, we can best continue to grow.

(*f*) That a new concept of mixed group dwellings is necessary. Technical design, popular thinking, and city regulations should all be adjusted to the new concept. The accepted "single-family row house," "multi-family dwelling," and "apartment," in two-room-deep planning, must all be included, but further developed. They must not be segregated, but must be freely intermingled. They must lose their categorical significance as "single-family houses," or any other compartmentalized type, and become more variable elements in community groupings. They must offer a wide range of space accommodations, up and down, or flatted, with maximum or minimum cooking, laundry, and other conveniences. All varieties should share in utilizing automatic services, comforts, common or collective nurseries, kindergartens, and the like, provided according to the nature of the individual community.

(*g*) That we cannot be content to design for a catch-as-catch-can group of occupants, but, whether in public or private enterprise, must seek for groups corresponding to the membership of the public utility societies of England or Holland. This does not eliminate the objectives of such well-constituted and experienced owning and management companies as the *Einfa Gehag* at Berlin, or the *Gartenstadt und Kleinhaus Aktiengesellschaft* at Frankfort on the Main.

(*h*) That students from many angles of approach should restudy the new techniques for such a free and experimental adaptation to diverse needs.

To visualize how a further diversification of dwelling-space might be achieved, while holding to the essential features of our present advance, I have sketched such variations upon a fine existing project in Germany, the *Britz*



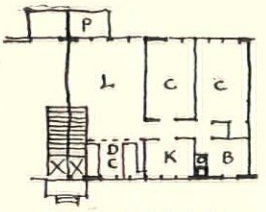

*Plan, elevation, and section of a very common type of four and a half room apartment in Berlin. The apartments are identical on each floor and throughout long building groups, the unit being about 30 by 32 feet. The section shows the basement access to gardens for each family*

*Siedlung* at Berlin. The ideas here presented are to be taken as a rough and imperfect outline for further theoretic study.

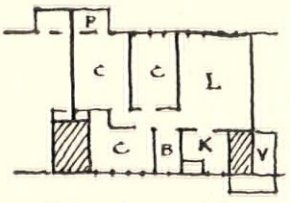
The great horseshoe at Britz is a much finer scheme than photographs would indicate. The single-family houses radiate from the central curve, this latter being composed of a large number of practically identical four and one-half room apartments on three floors. Each apartment is provided with a garden on the court side, in a series of terraces sloping down from a level half-way up the basement wall. The gardens are reached by going to the basement, climbing up half a flight of stairs in an areaway, and then walking down again along the slope to the various garden levels.

In the alternative scheme it is proposed to move the structure slightly further back from the street, retaining the same shape and stair spacing. Our object is to replace the identical four and one-half room units with a diversity of types. The first floor is dropped a few feet, to the top garden level; on the outside of the curve this puts it a few feet below the front yard. This will permit masking the minor rooms, which are placed on the side of the front yard and are shielded by a hedge. All entrances are directly at the exterior of the building. They are approached along paths that slope a little more steeply than the garden, reducing exterior steps to a minimum. The first-floor entrances are on the opposite side, and are reached by an occasional archway through the building, such as already exist.

With this preliminary modification, which gives all floors their direct outside entrance, and necessitates only one flight of internal stairway (from the second to the third floor), we

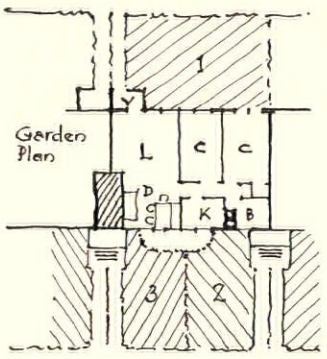


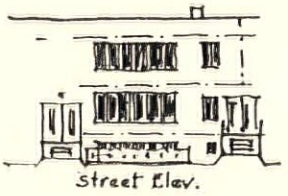

*Plan of third floor*

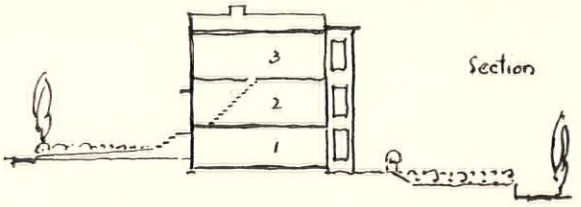


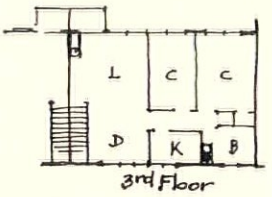

*Plan of second floor*

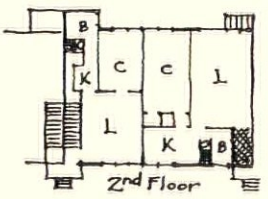
*The above represents building unit A, described in the text. At the left is the plan of the first floor, showing the relationship of the gardens for each apartment*



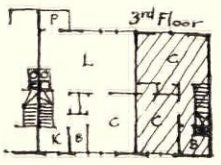



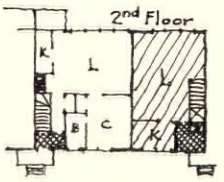



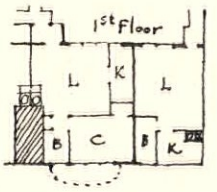



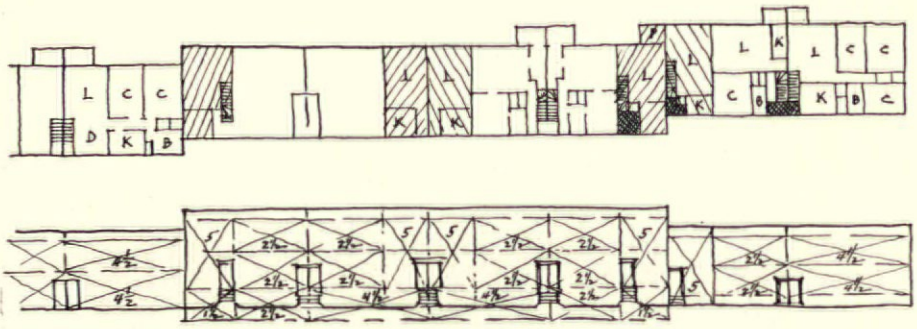

*The above second and third floor plans represent building unit B with a four and a half room apartment on the third floor; a two and a half and a two room apartment on the second floor, the latter sharing the vestibule with the third floor; the first floor is another four and a half room unit similar to the third floor except for entrances*

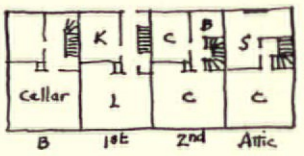



*The C unit: on the second floor a two and a half room unit, and the lower part of a two story unit of five rooms with bedrooms on the third floor*






*Above, the four floor plans of the typical one-family house in such a group*

*Plan and diagrammatic elevation showing one of many possible combinations of units A, B, and C in two and three story dwellings. Any number of other variations would be possible without destroying the unity of the exterior as a whole*

are ready to vary our types. Three different building units have been evolved, called *A*, *B*, and *C*, all of the same width and interchangeable. Building *A* might have identical four and one-half room apartments on all floors if the vestibule entrance were shared by the second and third. To give these two floors separate entrances and direct access to their respective gardens, a variation can be introduced in the second floor, giving it a second vestibule and one more bedroom instead of the dining alcove shown on the standard plan.

When we come to Building *B* we have on each—or either—side of the stair a four and one-half room apartment on the third floor; on the second floor one two and one-half room suite, and one two room suite that shares the vestibule with the third floor; on the first floor is another four and one-half room unit similar to the one on the third floor except for entrances.

In the *C* unit there is on the second floor one two and one-half room unit and also the first floor of a two-story unit of five rooms, with its bedrooms on the third floor. The rest of the third floor is occupied by a three-room apartment. The ground floor can contain the usual four and one-half room unit, provided that the floor above is made to support the upper partitions; otherwise the ground-floor can be divided into one two and one-half room and one one and one-half room apartment as shown.

A larger composition based upon *A*, *B*, and *C* units might then work out as shown in the plan and diagram. Any number of other variations would be possible without showing differently on the exterior, since the ground-floor divergencies would be hidden by the hedge. No basement is required, though a pipe and conduit trench might be needed along the outside of the front wall. Heating would be by small gas-fired boilers for hot-water radiation in each apartment separately, the apparatus for which is now perfected, eliminating all piping except gas and cold water to each apartment. The stacks for these boilers are provided in the plan. Waste would have to be carried to common points here and there in the development, unless incinerator stacks were introduced.

The various relationships involved—the amount of diversification, the desirability of various types of dwelling space, the need or needlessness of gardens for every dwelling—all these and many more questions can be ironed out by a process of cross-criticism. The aim of diversification has however been established and illustrated. Why turn out houses alike by the dozen, each with an inexcusable amount of waste storage space, and then confine apartment dwellers to two and a half or four and a half rooms, with no storage space at all, and only occasionally with cellar access to the garden?

Further architectural interest will be found in a combination of two and three story buildings, and occasionally four stories, with common stairs to the top floors, need not be avoided. Study and criticism by architect readers is invited.

In the great blighted areas of many large cities land costs have so receded as readily to permit an average height of two and a half stories in replacement schemes. In smaller cities land has seldom, in the past, warranted buildings higher than this standard. There is, then, almost no limit to the application of these proposals.



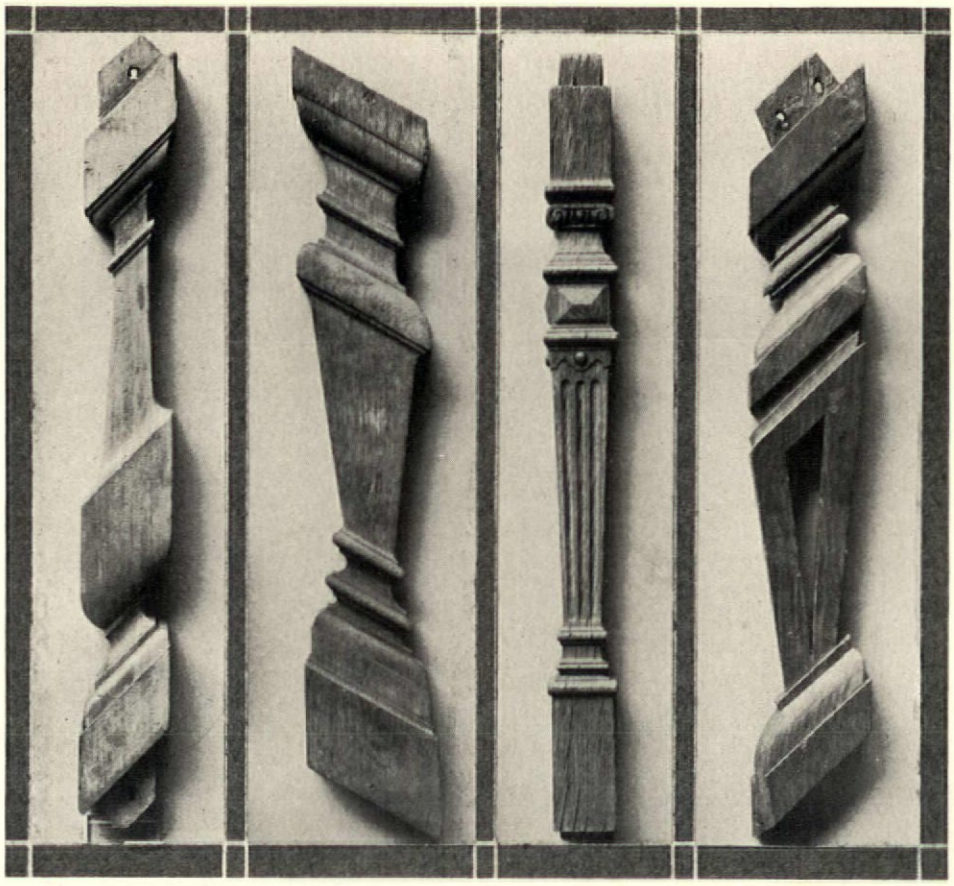
*From left to right: oak, later 16th or early 17th century; oak, 16th century; oak, 16th century, from the old monastery, Southall, Middlesex; oak, 16th century; oak, late 16th or early 17th century, from Ealing, London*

*A collection of seventy-six wooden balusters from English staircases has recently been acquired by the Metropolitan Museum of Art, New York City. Sixty-nine of these were obtained by purchase, the remaining seven being a gift from Acton Surgey, Ltd., of London. The collection illustrates rather clearly the development in England of the stair baluster from the late sixteenth century to the third quarter of the eighteenth century*

*The balusters fall into three general periods: the later sixteenth and the first half of the seventeenth century; the second half of the seventeenth century; the eighteenth century to about 1770. The overlapping of styles has made the dating of certain examples more or less hypothetical*

# English Balusters

FROM A COLLECTION IN THE METROPOLITAN MUSEUM OF ART, NEW YORK CITY



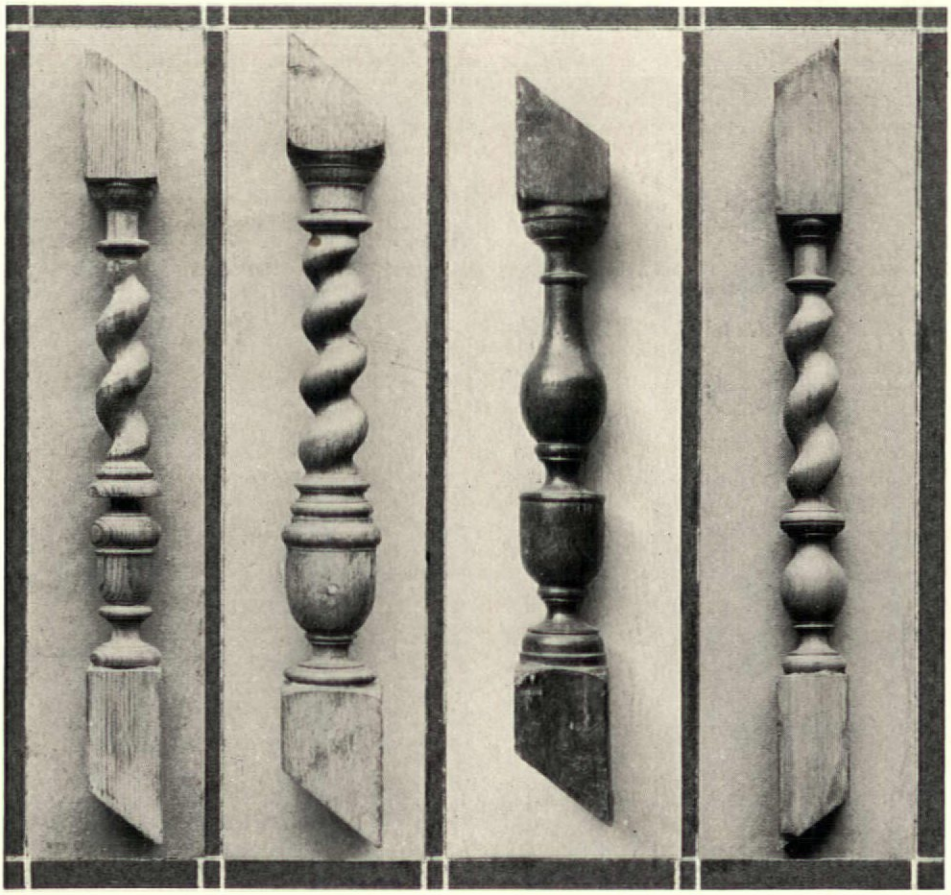
*At left, reading from left to right:*

*Walnut, first half 17th century, from Great Windmill Street, London*

*Oak, first half 17th century, from Market Place, Yarmouth*

*Oak, first half 17th century, from Eastwell Towers, Kent*

*Oak, first half 17th century*



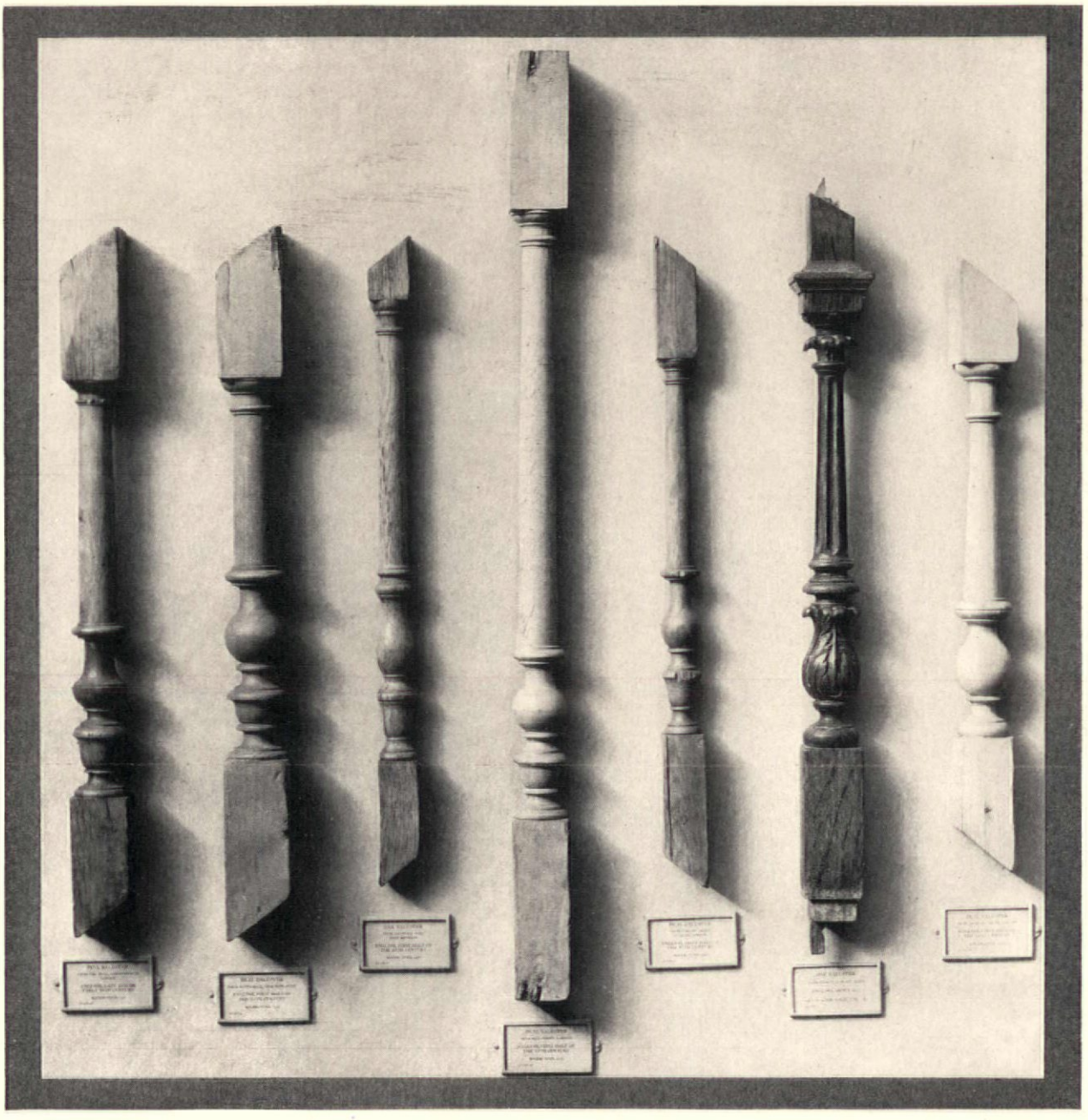
*At left, reading from left to right:*

*Pine, second half 17th century, from Spitalfields, London*

*Oak, second half 17th century, from Guildford*

*Oak, second half 17th century, from Kiddal Hall, Leeds*

*Deal, late 17th or early 18th century, from Hanover Square, London*



*In the panel above:*

*Pine, late 17th century or early 18th century, from The Mall, Hammersmith*

*Deal, first half 18th century, from Blyth Hall near Doncaster*

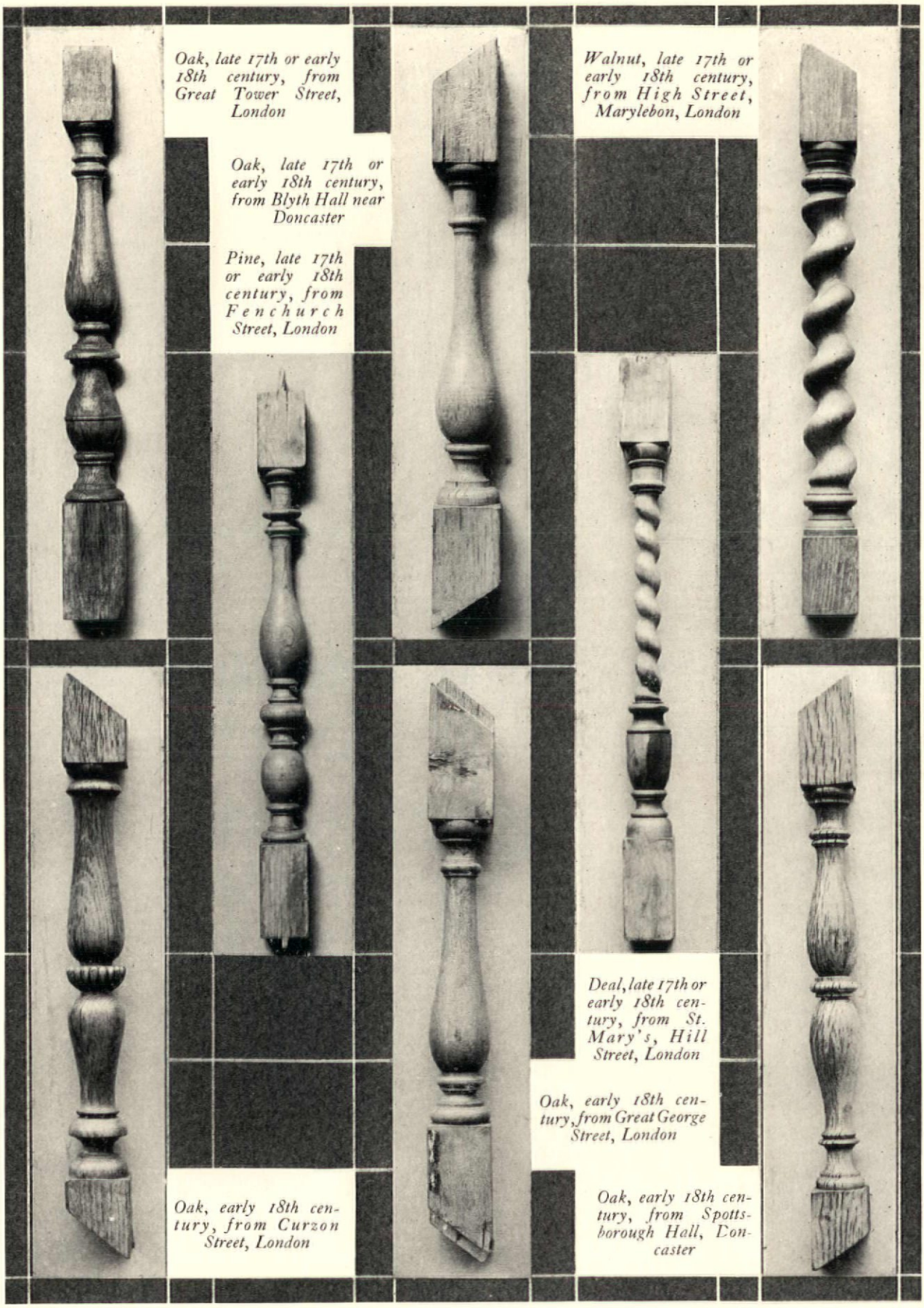
*Oak, first half 18th century, from Sandwell Hall, West Bromich*

*Deal, first half 18th century, from Hill Street, London*

*Deal, first half 18th century, from Parson's Green, Fulham, London*

*Oak, about 1693, from Chipstead Place, Kent*

*Deal, first half 18th century, from Charles Street, London*



*Oak, late 17th or early 18th century, from Great Tower Street, London*

*Oak, late 17th or early 18th century, from Blyth Hall near Doncaster*

*Pine, late 17th or early 18th century, from Fenchurch Street, London*

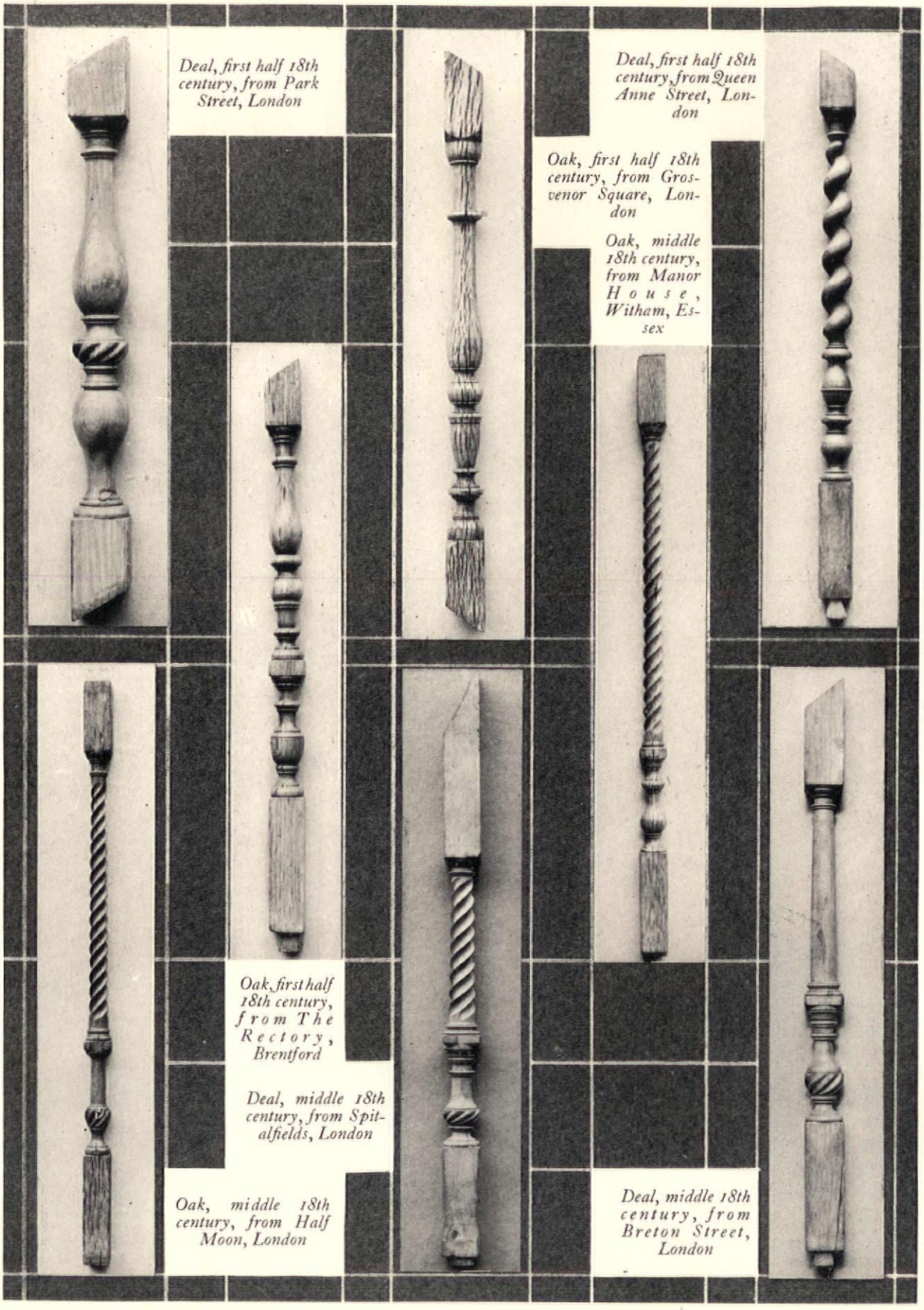
*Walnut, late 17th or early 18th century, from High Street, Marylebon, London*

*Deal, late 17th or early 18th century, from St. Mary's, Hill Street, London*

*Oak, early 18th century, from Great George Street, London*

*Oak, early 18th century, from Curzon Street, London*

*Oak, early 18th century, from Spottsborough Hall, Doncaster*



*Deal, first half 18th century, from Park Street, London*

*Deal, first half 18th century, from Queen Anne Street, London*

*Oak, first half 18th century, from Grosvenor Square, London*

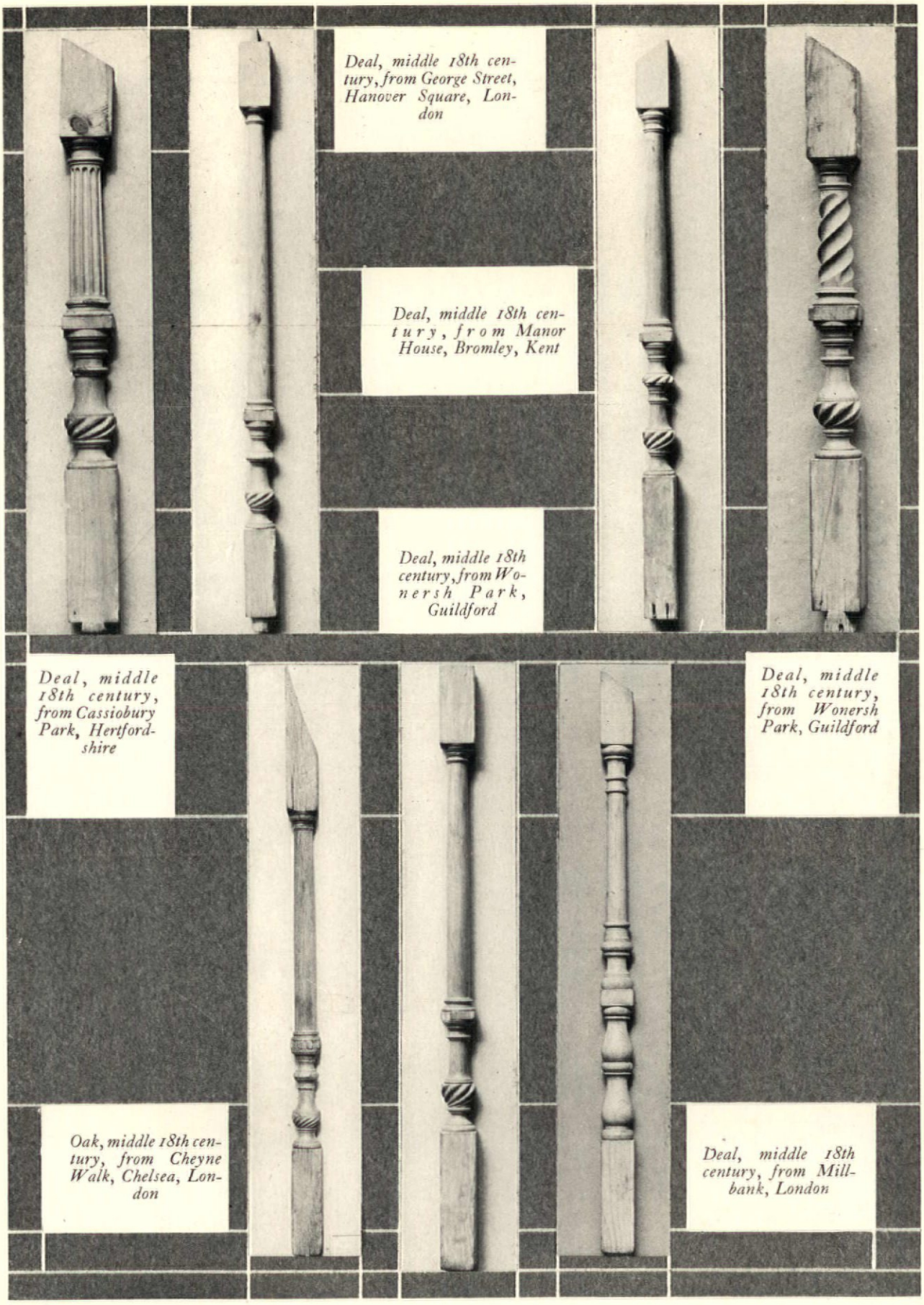
*Oak, middle 18th century, from Manor House, Witham, Essex*

*Oak, first half 18th century, from The Rectory, Brentford*

*Deal, middle 18th century, from Spitalfields, London*

*Oak, middle 18th century, from Half Moon, London*

*Deal, middle 18th century, from Breton Street, London*



*Deal, middle 18th century, from George Street, Hanover Square, London*

*Deal, middle 18th century, from Manor House, Bromley, Kent*

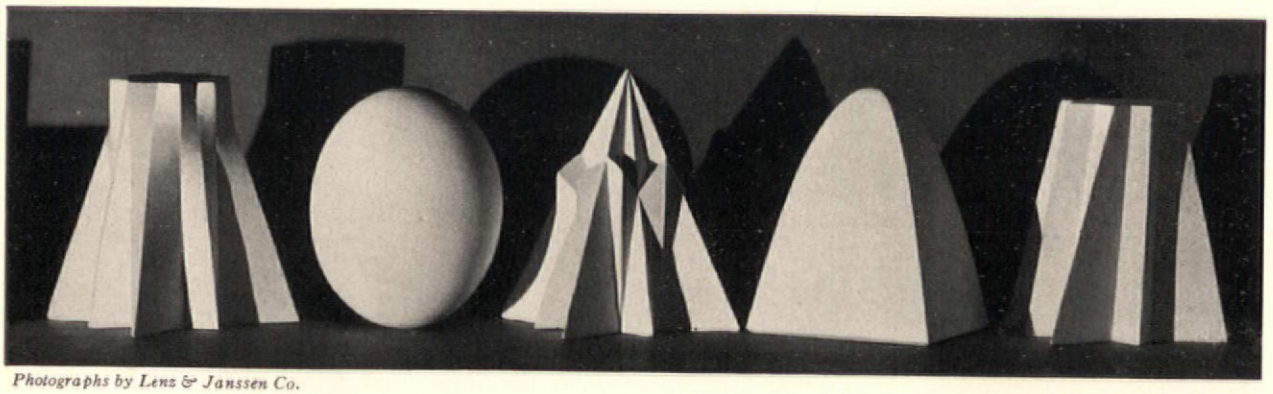
*Deal, middle 18th century, from Wonersh Park, Guildford*

*Deal, middle 18th century, from Cassiobury Park, Hertfordshire*

*Deal, middle 18th century, from Wonersh Park, Guildford*

*Oak, middle 18th century, from Cheyne Walk, Chelsea, London*

*Deal, middle 18th century, from Millbank, London*



*Photographs by Lenz & Janssen Co.*

# Can We Invent New Forms?

## *By Rutherford Boyd*

*Copyright, 1933, by Rutherford Boyd*

THERE is a familiar and yet a curious duality in the very nature of man—he demands variety or change and yet he admires order, system, or an equilibrium. These extremes of his experience through all the ages are imposed upon him in the paradox of his existence, so he has learned to like them; nor can he live without them. Long ago, out of sheer necessity he had to cope with change in *quantity* and, as he dealt with it in many circumstances and places, he invented in a haphazard way that great device, the system of Number.

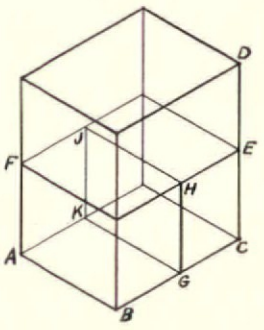
Centuries of the use of Number in barter and communication and in his "earth measuring" led him to invent another great instrument, "geometry." Meanwhile he was groping slowly, vaguely toward his first ideas of proportion, like the relation between five feet and eight feet, or of two units to three. So he invented another device for the relation of whole numbers to each other in architecture, and centuries afterward it is handed down, for good or for ill, by Vitruvius as the celebrated "modulus."

The Pythagoreans sought to trace the origin of all things to Number, investing certain integers, whole numbers, with extraordinary attributes. But the Greeks found that life was not so simple as all that. Eventually these ideas of integers in Proportion were perforce developed and expanded to include the more difficult group of numbers appropriately called the "irrationals," or incommensurables. In the tenth book of Euclid's Elements we have at last the complete system of a geometrical progression. Thus we have developed an instrument of change or, if you like, of ordered increase or growth, that has a curious duality in its own nature. It changes continuously (in size or magnitude) and yet is always the same (in ratio or proportion).

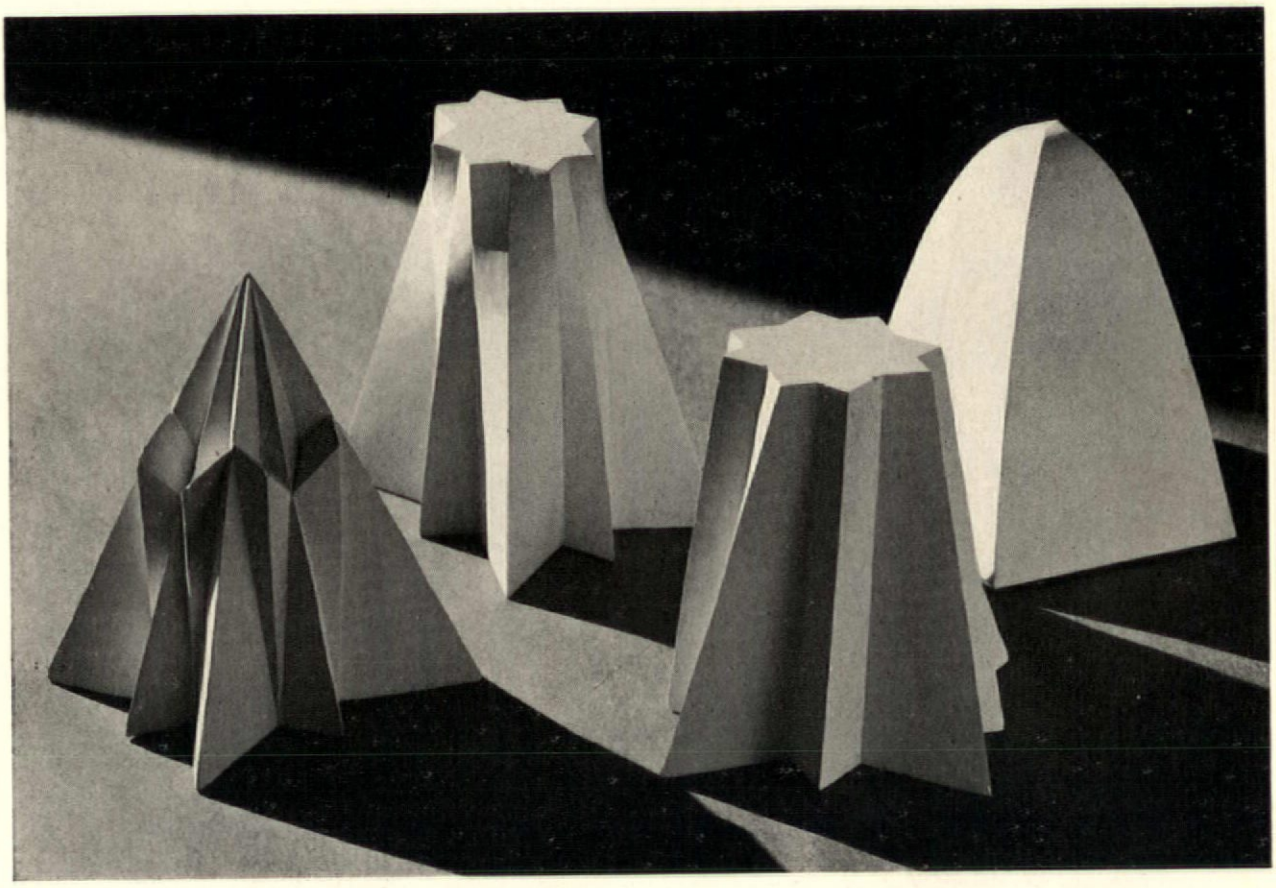
Quite recently developed and applied in tridimensional form, this device—increase in magnitude by a constant ratio—becomes the basis of a system of proportional rectangular volumes, called "Ratio-Envelope of Form."

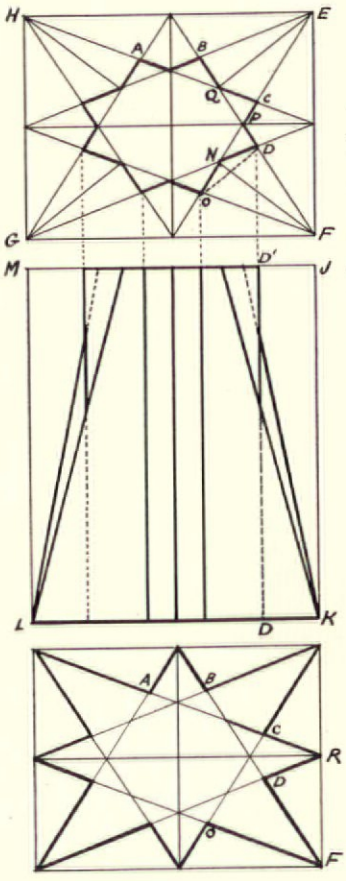
Having read faithfully all that has so far been said about this device, the friendly architect interrupts with a difficult question: "Admitting the logical development of such a series as the 'Ratio-Envelope of Form,' can we actually evolve from it new form-ideas?" And without waiting for the answer, he asks another, "If these new forms can be created consciously, how can this be done?"

Fortunately for the author's peace of mind, just those questions had been anticipated! Experimenting and modelling in the clay and then carving in




*All these models are evolved within the "bisection-volume" of the rectangular "ratio-envelopes of form." In this shape if the longest dimension D C is bisected at E, the half-volume E C B A is similar in shape to the whole rectangular envelope. Similarly when C B is bisected at G then the quarter-volume H G B A F is similar to the half and the whole volume. See the January issue of* ARCHITECTURE





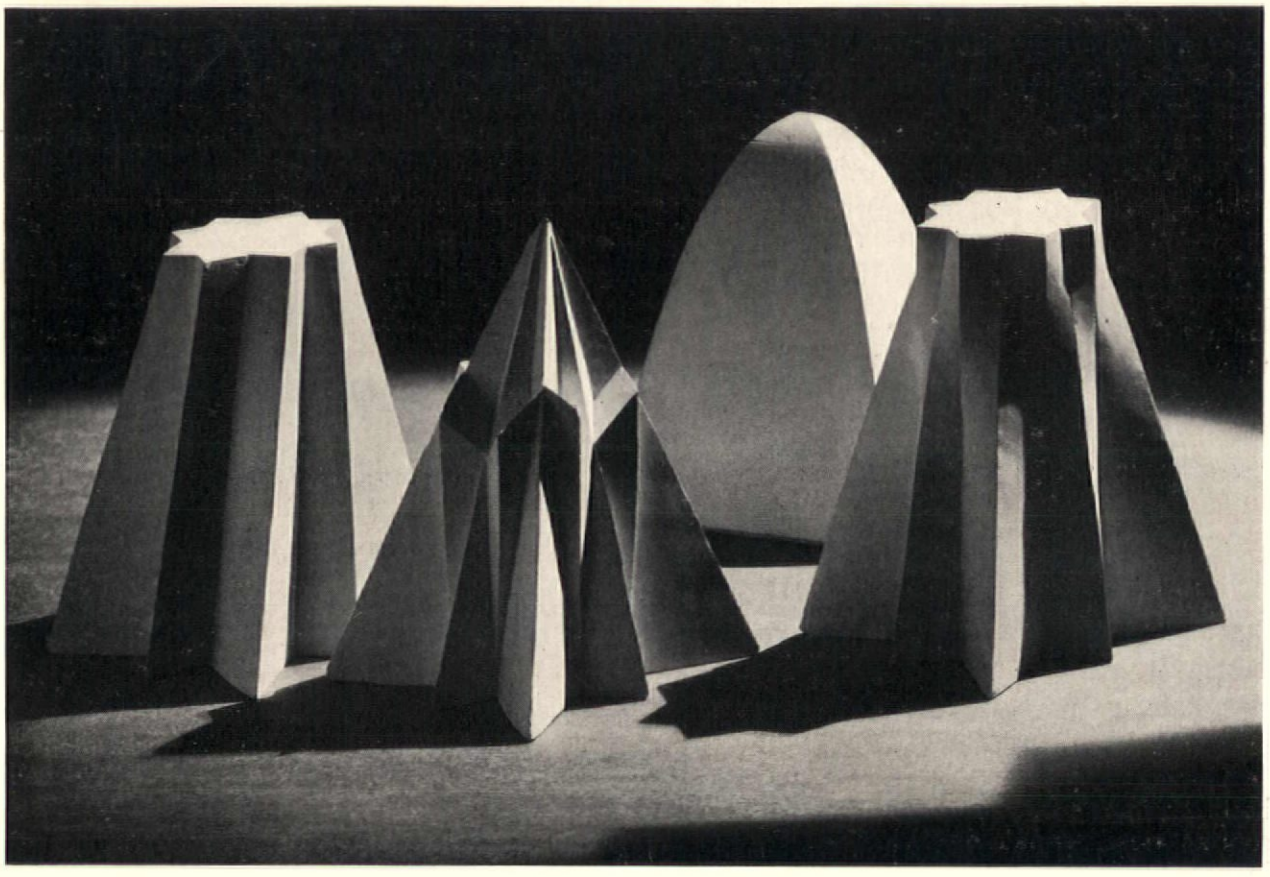

*Three of the models shown on these facing pages, developed from an identical base pattern (lower diagram), have as an envelope the bisection-volume, the diagonals of the bisected rectangles forming the inscribed star. The first diagram shows the top plan of two models. Note that the re-entrant angles of the base are identical in plan position with the corresponding points A B C D O of the top. The model behind the "pyramid" has sixteen warped surfaces rising from base star to top star. In another model projecting edges are straight lines joining base star to top star, the inner edges being straight lines joining the corresponding re-entrant angles.*

*The pyramidal model involves a secondary de-*

the plaster, he sought an answer to those questions in this group of seven models. It is only a tentative answer, certainly incomplete, yet suggestive of the potential wealth of this new source of form-themes. The group of plaster models presented here is strictly structural in every detail. They are all developed from and contained within the same "ratio-envelope of form," the "bisection" volume, as defined in this diagram (bottom of page 323).

These plastic compositions are carved all to the same scale and each form-theme emanates directly from the spatial anatomy of this particular "envelope." The models demonstrate only a few selections from the great variety in form-themes which can be generated structurally by this approach to Design in tri-dimensional form. The captions and diagrams fully describe the principal themes of these proportional shapes.

Remember that these models exhibit variations on some only of the main planes and divisions within this particular envelope. Also that each different proportional shape in this series of "ratio-envelopes" can be likewise manipulated and controlled by a discriminating seeker after its secrets, many of them as yet un-



explored. For in this series we have an instrument for the synthesis of form-organization the possibilities of which have not yet been reached or defined.

Which leads us again to consider the question: Can we hope ultimately to create or invent new Form?

It seems to have been our custom, when the tradition of a great style wanes, to seek in many places. Sometimes we return directly to nature's infinite variety of form. Borrowing here and adapting there we arrive somewhere, somehow, and a new style is proclaimed! Inevitably the adaptations from natural and other form-sources become conventionalized anew into a group of abstract forms, often without much ancestral resemblance.

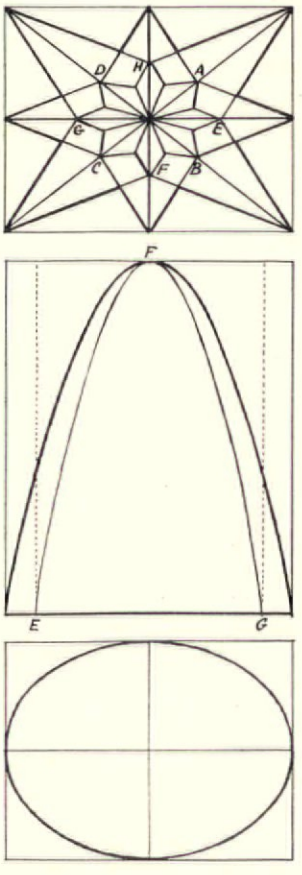
Every phase in the art of the past exhibits this phenomenon—a few basic forms repeated, refined and redesigned. Around and in these basic design-ideas we create a style, in which, being very human, we incorporate the human figure with greater or less variety. One is tempted, when considering the evolution of style, to use the phrase "an accident of chance!"

Certainly our retrospective view of Design can never be from the viewpoint of its creators

*velopment intersecting the edges one third down from the apex (see diagram at right). The points A B C D are the focal points of the ratio-envelope. These interrupting planes intersect the other alternate star edges at the mid points E F G H. The form is completed by verticals rising from the eight re-entrant angles of the base.*

*The fourth model involves the parabola, and may be called a rectangular paraboloid. In the middle diagram at right, the parabola E F G is the vertical section through the shorter dimension, the other parabola through the longer dimension of the base.*

*The diagram at right shows the ellipsoidal model pictured on the next page*



or even of its contemporaries. Those pressures and influences that overwhelmed a style and overturned its traditions, seem to have varied from an emperor's edict to the fancy of a courtesan. More likely, in sober truth, a complex of political, religious, social, and economic causes profoundly affected each transition in style. What faint vestiges of the glitter and glory of a court or of the pomp of chivalry that now remain to us, are only the faded glory in the tapestried background of art in its long history.

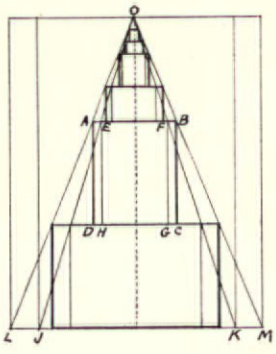
What does not change, what is the same vision to our eyes as for those who worked in the arts of old, is the great Form itself, be it cathedral, or pyramid. The chemistry of change may produce new beauty in a patina or a tonal and chromatic harmony that is far from the designer's original intention in color. The foliated spire, great Theseus in his pediment, a fragile kylix or rock-hewn colossi—all impress us with their innate proportions, the inevitable majesty of their great Form—as much the property of ourselves as it was theirs in the past.

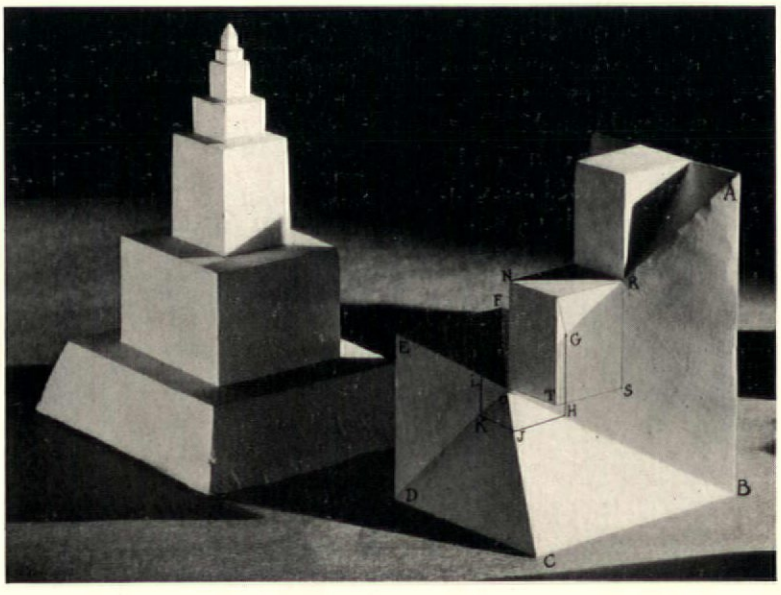
Our contemporary scene exhibits, however, an amazing variety of sources, creeds, trends, and what-not in the criteria of our taste. To generalize, there seems to be a definite drift away from over-elaboration of ornament, wherever derived, toward a greater, more "intelligent" designing of simpler surfaces, plane and curved, with a studied contrast of materials and of their textures. In other words, today we appear to have taken another step or two in departure from the *appearance* of nature toward abstract formal organization. Perhaps too often dominated by the conventional engineering viewpoint or some "ism" of the moment, yet our contemporary style is evidently more abstract, more geometrical, than ever before.

In the arts men of courage now urge with foresight less adaptation, less of the eclectic procedure, an approach to each problem with full consideration of all that function, materials —that every integral factor of the design problem—can yield to artist or architect and to serve broadly as the basis of his inspiration.

But much of our "inspiration" is a discrimination constantly active in form-selectivity as we accept and discard, as we analyze and synthesize in design. With more than inspiration, more than conviction, we must penetrate to that acute perception of *Form* which lies in a conscious appreciation of what may be done by us, not only what has been done, by nature or by man.

So much toward the ideal, so much that is well known, but beyond all this, even beyond the individual concept that dominates the design, is an immutable geometry of the proportions or dimensions of the "envelope," the great Form inclosing the project. Not the outward shape alone, but the study and understanding of the generation of interrelated forms and in the spatial design of the inclosing Envelope of Form. This will be in itself the creation and invention of new Form.




*At left of the photograph, a model showing a series of bisection volumes within a "pyramid" of similar proportions as shown in the diagram above.*

*The other model is a remarkable demonstration of many surprising relationships, among which we mention only a few: A B is the greatest dimension, B C the next, and C D the shortest dimension of the rectangular envelope; D C is half of A D, E F is half of B C, and F G is half of C D. These lengths are six terms in this proportional series, and the point G is the precise centre of the form. G H is on the same plane and parallel to A B and is one quarter of it, also half of D E. Again, H J is one quarter of B C, J K one quarter of C D, and so on*



*These murals are now completed and placed in the central rotunda of the Los Angeles Public Library, of which building Bertram G. Goodhue was the architect, with Carleton Monroe Winslow associated architect. Mr. Cornwell started the work on this series nearly five years ago, his purpose being to express the history of California from the days of the Spaniards. In a problem so dependent upon color unity, obviously these black-and-white approximations must fall far short of conveying the effect on the walls*

# Dean Cornwell's Murals for the Los Angeles Library



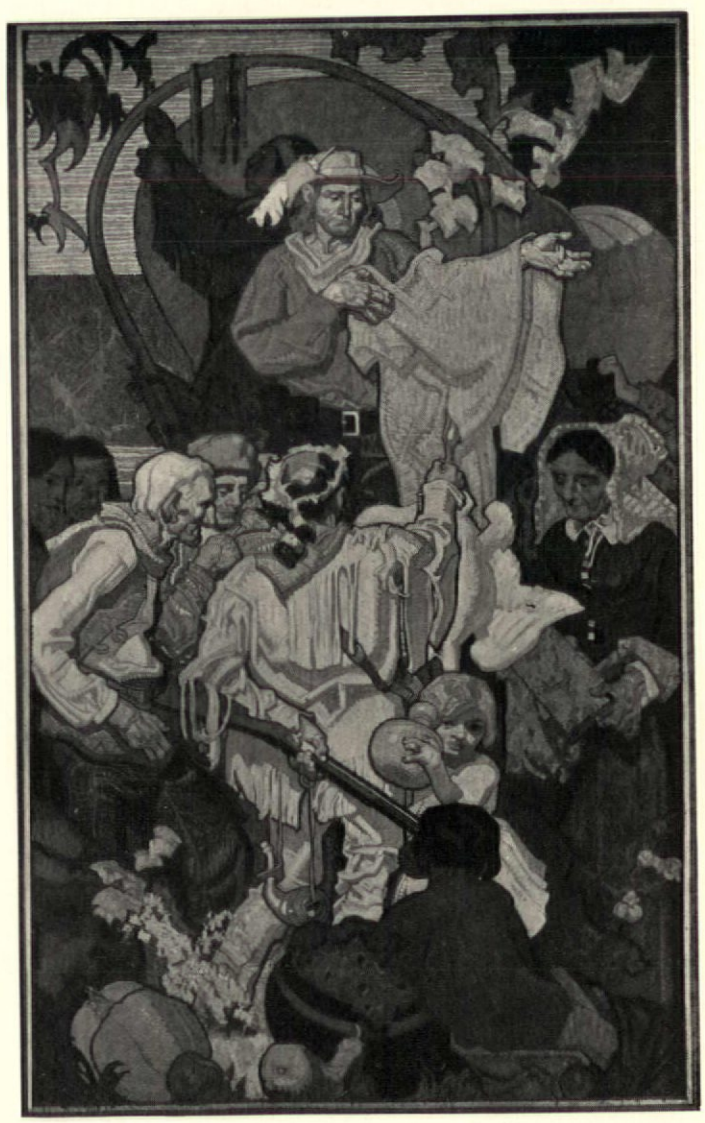
© Floyd H. Faxon

*THE MISSION ERA*

*EDUCATION—the monk*



*COMMERCE—the Indian trader*

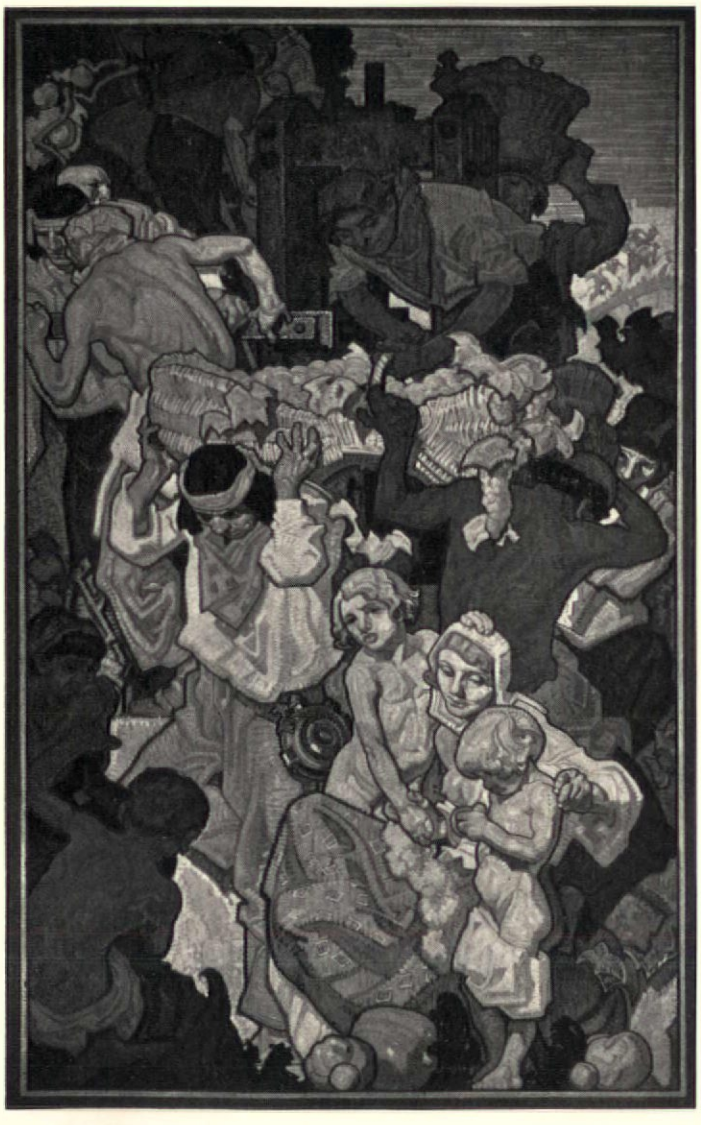




© Floyd H. Faxon

*THE AMERICANIZATION OF CALIFORNIA*

*AIR—the fruits of the earth*



*FIRE—the potters*





© Floyd H. Faxon

*THE FOUNDING OF LOS ANGELES*



*WATER*

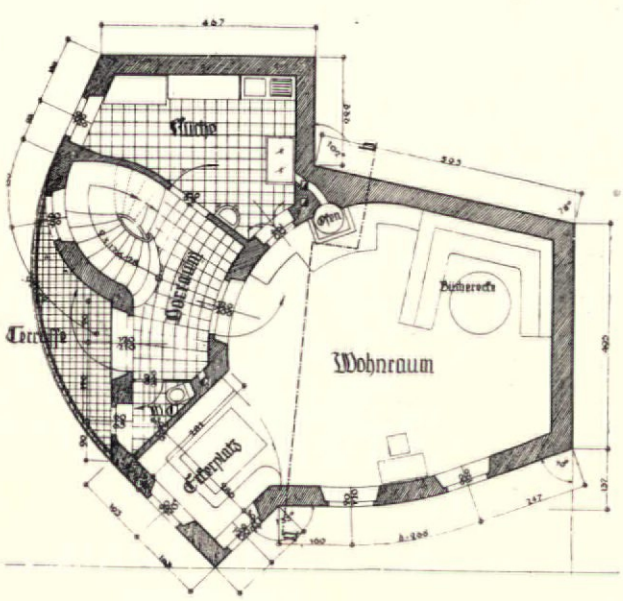
*Origin of irrigation—*
*Moorish water wheel*

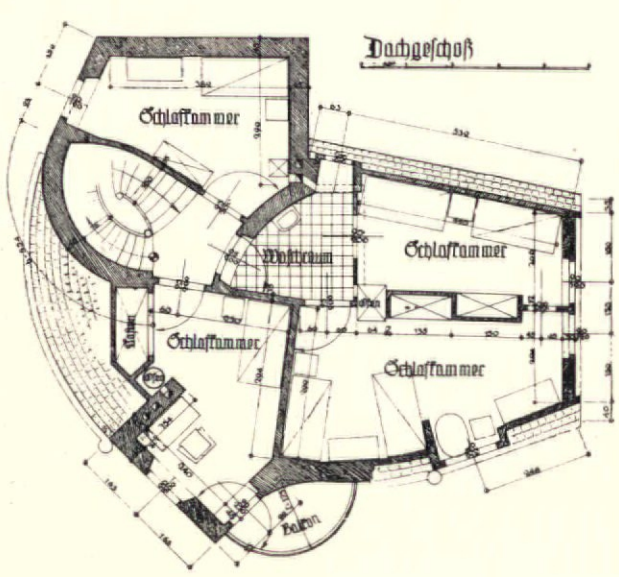


# Ein Landhaus

*Devotees of modern architecture have produced many wondrous things in their creative heat of recent years, but here is a country home in Dürnstein which seems to represent nearly the ultimate in effects without apparent cause. The architect is Hofrat Professor Dr. Karl Holey of Vienna. We have not been able to interview him as to this creation, but it would be particularly interesting and instructive to learn just why he has produced this combination of two-dimensional and three-dimensional forms. The shapes of the various rooms interest us particularly with a degree of wonder not only as to why they are shaped thus, but also as to how the workman with his try-square ever managed to construct them.*

*Our illustrations are reproduced from* Der Baumeister



# BOOK REVIEWS

PLANNING PROBLEMS OF TOWN, CITY AND REGION. 158 pages, 6 by 9 inches. Philadelphia: 1932: William F. Fell Co. $3.

Here are the papers and addresses presented at the twenty-fourth National Conference on City Planning held at Pittsburgh, November 14 to 16, 1932. One of the most significant points discussed was the fact that every large city in this country lost population in its central areas between 1920 and 1930.

STRENGTH AND STABILITY OF CONCRETE MASONRY WALLS. Report of an Investigation conducted by The Engineering Experiment Station, University of Illinois, in co-operation with The Concrete Masonry Association, The Portland Cement Association, The Western Brick Company. By FRANK E. RICHART, ROBERT B. B. MOORMAN, and PAUL M. WOODWORTH. 38 pages, 6 by 9 inches. Illustrations from photographs and graphs. Bulletin No. 251. Pamphlet binding. Urbana, Ill.: 1932: University of Illinois. 20 cents.

ÆSTHETIC MEASURE. By GEORGE D. BIRKHOFF. 226 pages, 8¼ by 11¼ inches. Illustrations from diagrams, vase forms in color, line drawings, and photographs. Cambridge, Mass.: 1933: Harvard University Press. $7.50.

The author, a mathematician, attacks the formidable task of measuring by means of mathematical formulæ our appreciation of two-dimensional forms and melodies, starting with the basic formulæ $M$ equals $O/C$ in which $M$, the measure, is equal to Order divided by Complexity. He carries us through a discussion in which one is amazed to find how well within reach is actual measurement of æsthetic impulses.

DECORATIVE ART. The Studio Year Book. Edited by C. G. HOLME. 140 pages, 8¼ by 11¼ inches. Illustrations from photographs and drawings, some in color. Printed in Great Britain. New York: 1933: The Studio Publications, Inc. Cloth, $3.50; wrapper, $2.50.

The latest in a long and dependable series of pictorial reviews marking the progress of English architecture, decoration, and the crafts, this time with more than the usual emphasis, perhaps, on the work of the modernists.

THE COLONIAL AND FEDERAL HOUSE. How to Build an Authentic Colonial House. By REXFORD NEWCOMB. 174 pages, 7 by 10 inches. Illustrations from photographs, plans, and drawings. Philadelphia: 1933: J. B. Lippincott Co. $3.50.

Dean Newcomb's experience in teaching architecture, and his ability to express himself clearly and concisely, has here been utilized in a good cause. The author explains the essentials of what we know as the Colonial and Federal styles in planning, materials, and details, inside and out. We might wish for a better presentation of the illustrations than the grouping together of small photographs on a mount and illustrating it as a whole.

THE CARPENTER'S TOOL CHEST. By THOMAS HIBBEN. 209 pages, 6¼ by 8 inches. Illustrations from line drawings. Philadelphia: 1933: J. B. Lippincott Co. $2.

Thomas Hibben, well-known architect, has performed a magnificent job in tracing, for his and other people's children, the history of tools, how they are used, and what has been done with them from the Stone Age to the present time.

HOW TO JUDGE A HOUSE. Report of the Subcommittee of the National Committee on Wood Utilization. 85 pages, 6 by 9 inches. Illustrations from photographs and diagrams. Pamphlet binding. Washington: 1931: U. S. Department of Commerce, Superintendent of Documents. 10 cents.

N. Max Dunning is chairman of the committee which has prepared this guide for the prospective home-builder, pointing out details of construction and design.

ALUMINUM IN ARCHITECTURE. 234 pages, 5¼ by 8¼ inches. Illustrations from photographs and drawings. Pittsburgh: 1932: Aluminum Company of America. $1.

A handbook made necessary by the wide and more varied use of the metal, telling of its properties, its available forms, and the technical details of its employment in building.

LIFE INSURANCE HOME OFFICE BUILDINGS. A Study of the Problems of Building Construction. 156 pages, 8½ by 11 inches. Illustrations from photographs and diagrams. Fort Wayne, Ind.: 1933: Life Office Management Association. $5.

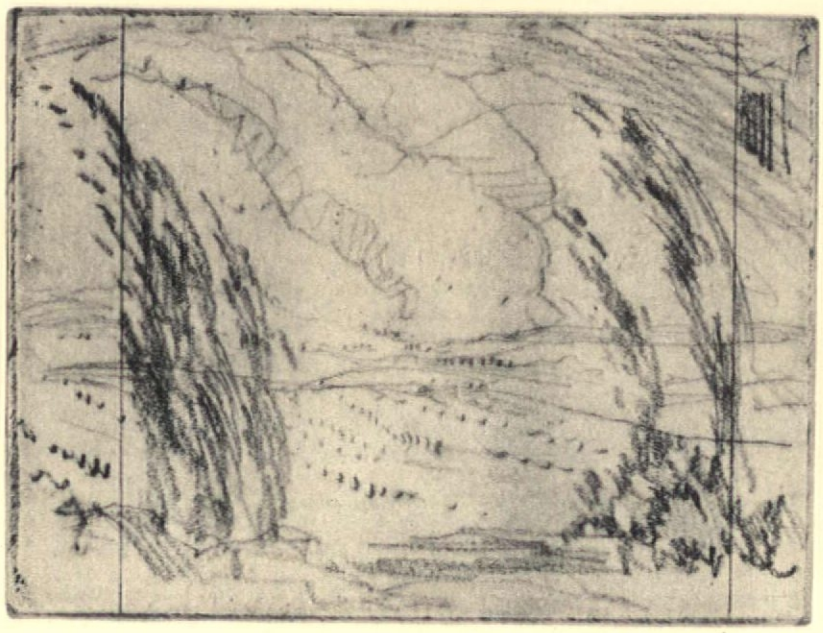
A compilation of a committee representing the insurance world, and consisting of an elaborate and comprehensive check list of requirements—an indispensable aid to any architect who happens to be designing an insurance company's home office building.

THE EVOLVING HOUSE. A History of the Home. By ALBERT FARWELL BEMIS and JOHN BURCHARD, 2D. 502 pages, 6¼ by 9¼ inches. Illustrations from line drawings and plans. Cambridge, Mass.: 1933: The Technology Press. $4.

A serious effort to trace the whole development of domestic architecture from earliest days to the present. The work will be in three parts, of which Vol. I only is now published, bringing the review of the evolution of the home, together with the social and economical forces which have governed it, up to the present time. The second and third volumes will deal with current housing conditions and methods, looking somewhat into the future.

# Soft-ground Etching— the Architect's Medium

## *By Gerald K. Geerlings*



This is the first small experimental plate the author did, reproduced at exact size of original. It illustrates his point about using small pieces of copper to get accustomed to the medium. The pencil went through the tracing paper in the lower left-hand corner. The vertical pencil lines near the sides show where the plate was cut later

THE "itch to etch" is a common complaint. The pressure of lots-of-busyness is the usual preventive. But the infection is likeliest to become malignant when there is a dearth of clients. After a summer of outdoor sketching the mere sight of etchings is apt to bring on a rash and drive the patient to copper. If the results are encouraging the after effects may be entirely beneficial, both as revitalizing personal enjoyment, and as a means of lowering the resistance of clients. However, when the effects are discouraging, the patient may be reduced to an irascible disposition. In order to prevent the latter, the following prescription is respectfully submitted, based on notes made while attending the Royal College of Art, London, and some subsequent clinical experiences.

Usually the treatment, but not the cure, consists in taking an etching needle in hand, and drawing on a plate prepared with a wax ground. The difficulty is that one does not ordinarily draw with as fine-pointed an implement as a darning needle, nor is one accustomed to bright red lines showing against a field of black. To locate black lines on white paper is difficult enough usually. Even with every possible detail going according to Hoyle from start to finish, the resultant print looks like a combination of so many thin wires, instead of so many sympathetic lines. Although a pen-with-ink may be a frequent means of architectural expression, an etching needle is by no means a twin spirit. The best of pencil sketches translated literally into a line-etching is doomed to failure because there is no conceivable similarity between a pencil line and an etched line. Actually, to produce a good etching involves conceiving of the pencil drawing as merely a preliminary guide, and not the model which the etching is to simulate. The realization of this fact is singularly disregarded, even by some seasoned etchers.

The treatment which will yield better results is *not* to attempt a line etching (at least at first). A more sympathetic medium is the so-called "soft-ground" etching. The tool is not the sharp darning-needle point, but an ordinary pencil used over ordinary tracing paper. Any one accustomed to manipulating the pencil, and desiring to etch, can succeed. This article attempts to describe how the tyro can sally forth on adventure bent. In effect a soft-ground etching combines the pencil quality of a lithograph print, with the distinctive printing quality and plate-mark of an orthodox etching.

With all the other forms of etching, if there is anything which goes wrong, it can always be mended in one way or another. Not so with the soft-ground medium. While it is possible after much experimenting to work over a plate with a second ground, it requires personal instruction. The descriptions given here have been gone into fully so that if carefully followed the plate would be complete when taken from the acid and the ground removed. If you wish to burnish down certain parts to reduce them in value, or to make other parts darker, all that is a long story, and not as readily related as demonstrated. Even when done the result would not likely be as satisfactory as doing the plate over and getting it "to come right" without any patching.

# SUCCESSIVE STEPS IN SOFT-GROUND ETCHING

*Note: The numerals in parentheses after each "Step" refer to corresponding numbers under "Materials," pages 336, 337 and 338. Perhaps it would be advisable to glance over these requisites first before reading further. Then when you are ready to begin a plate, spread out these two pages before you, and carefully follow directions.*

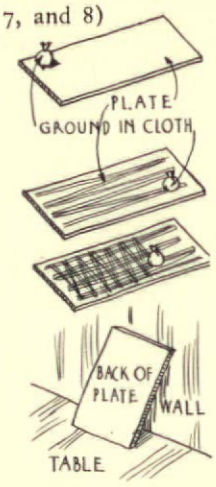
## FIRST STEP: THE DRAWING (1 and 2)

Select a subject which you want to draw, and can draw, better than any other. Reduce the composition to its simplest terms. Speak only one sentence but say it clearly; reserve long paragraphs and sentimental speeches for a future date. Try to constrict the drawing to a small area, perhaps 5 by 8 inches for your first essay. Make a complete drawing of the effect you would like to see in a print. Then do a simplified tracing of the main elements only, using a red chalk pencil lightly. Don't use more red guide lines than are actually needed to act as a skeleton for the drawing, because too many will cramp your style and result in a cautious, stiff production. Trim the drawing so that it is about one inch larger around all margins, than the size of the copper. Put this drawing away in a safe place.

## SECOND STEP: PREPARING THE COPPER PLATE (3, 4, and 5)

Get a piece of copper the size of your drawing. Take the plate to a work table alongside the sink and bevel the edges with a file. All copper filings must be thoroughly brushed off. This is essential because rubbing one speck of copper about on the surface can cut devilish scratches. Wet the plate under the running water. Dip a piece of felt into the whiting paste, and rub the surface of the plate. Replace the felt in dish. Wash plate with running water. Dip the other piece of felt into the vinegar-salt solution and rub plate. Repeat each operation twice more. Rinse plate under water thoroughly. Be certain hands are not greasy, but do not touch the top surface. Place plate between clean blotters and dry. Use a clean handkerchief to rid surface of any slight fuzz which lingers.

## THIRD STEP: LAYING THE GROUND (6, 7, and 8)




It is absolutely essential that this step be done quite perfectly, or all the work which follows may be useless. The purpose is to coat the copper with as thin a breath of wax ground as possible, so that when submerged in the acid, the copper will be protected from corrosion. From this point on never touch the top surface of the plate; get in the habit of holding or carrying it poised on the tips of the fingers and thumb of your left hand, like a waiter carrying a tray. Shut all windows and doors so as to prevent the movement of air from depositing dust. Each speck which settles on the plate results in puncturing the wax film, and allows the acid to bite through later.

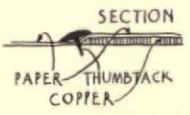
Place the copper on the heating plate, and regulate the gas to a low flame. When the copper plate has become warm, take the cloth-encased ground, place it on the plate, and wait until it begins to melt. Then rub it gently to and fro over the entire surface of the copper until the latter appears to be covered. Don't worry about its not being evenly distributed. Don't let the copper get so hot that the ground sizzles; if the plate is getting too hot, remove it for a few moments. Use the dabber in gently dabbing the plate all over until the ground is evenly spread, or use the roller to accomplish this same end. This will require a little practice until you can do it quickly and well. When employing the dabber or roller, start at one end and methodically finish an area parallel to that end before proceeding to the adjacent strip. Continue until the entire plate has been completed. Take the plate from the heater and let it cool, face inclined downward so that dust cannot settle on it. Prop it so that it can't slip and thereby ruin the ground. After it is cool place it on the table where you intend doing the drawing.

## FOURTH STEP: AFFIXING DRAWING TO PLATE (9)

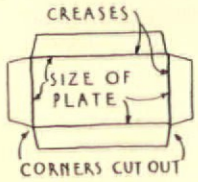
There are two methods for securing the tracing-paper drawing over the plate.

(1) Put the copper plate on a drawing-board in a position where it will be most comfortable for drawing, then place the tracing over it so that it fits exactly. Use large thumbtacks all along the edges so that both are held firmly. That is all. This is the simplest method and is fairly satisfactory, except that the paper cannot be stretched absolutely tight. (See sketches to right.)



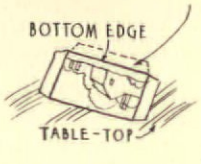

(2) Another method—first cut out the corners of the tracing as shown in the sketch below. Crease the drawing so that these folds enclose an area equal to the size of the plate. Tilt the plate up on the bottom edge, until it stands in a nearly vertical position. Put some paste or rubber cement on the back of the plate along the top edge. Place the drawing over the plate so that its top edge will correspond to that of the plate, and press the overhanging margin so that the paste will adhere. Then tilt the plate up on its bottom edge until it is vertical, put paste on the back of the plate along this edge, stretch the drawing taut and hold until the adhesive dries. Repeat on the two remaining edges. The object is to paste the margins of the drawing to the back of the plate without letting your fingers touch the front. Put the plate, with the drawing-side up, somewhere so that it is horizontal, and blow a fine spray of water on it. The drawing will dry out quite taut, perfect for drawing. If the corners dry out with serious wrinkles, restretch the paper.

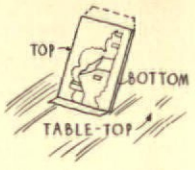








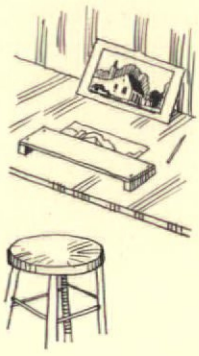



## FIFTH STEP: DRAWING ON THE TRACING PAPER (10)

The preceding steps may sound tedious, but they should not take over a half-hour (excluding the first step), once you have the materials in readiness and have gained a little experience. Up to this point all has been preparatory; this fifth stage represents the actual problem. All that precedes and follows is chemistry; this step is purely artistic. It is here that the real quality of the print will be principally determined. If you are not feeling up to par, put the plate away until you are. Only if you are snorting with impatience to draw, should you tackle it. With vigor and spirit the job will be complete in a few hours with a vital freshness which persevering doggedness can never equal.

Place your final study before you, and the handrest so that its cleats clear the sides of the plate. Sharpen the 2B pencil. Then draw boldly, without a thought or worry over copper. *Remember*, you can make no erasures, and the pencil point only must touch the surface of the paper. *Forget* everything except that you are bending all your artistic talents to produce your best pencil-drawing to date.



The print will look approximately like whatever you put on paper. Try for directness, rather than building up tones by successive strokes. You should have studied your subject so well that you know exactly how to draw it without any hesitation. The resulting print will show precisely how well you know your subject, and how sure you are of your drawing. There is no luck in this connection. If in the midst of the drawing you feel uncertain how to delineate a certain passage, take time off and determine how best to do it by trying several methods on a separate piece of paper.

A few precautions: (1) Don't press so hard as to tear through the tracing paper; if you do the resultant mark will have to be "stopped out" before the plate goes into the acid bath, as described in the next step. (2) Try to work where the temperature will remain the same from start of drawing to finish, and during the middle part of the day when natural changes of temperature are less than those from early morning to midday; otherwise the wax, being softer during the warmer periods, will adhere more to the under side of the paper than you suspect. (3) Don't work in the sun.

## SIXTH STEP: REMOVING THE DRAWING (11)

When you are certain you have drawn all that you should, cut the drawing off around the edges. Work from the back of the plate so that a slip of the knife will not damage your work. Put the plate down again, face upward. Beginning with one corner, carefully peel the drawing off. What has happened is this: wherever you have used pencil, the ground has adhered to the paper. Where you have borne down hard nearly all the wax will come away from the copper, so that when the plate is in the acid, the line will be bitten deeply. Where you have made a light line, only a fraction of the wax has come off, thus allowing the acid to attack the copper less vigorously. Keep the drawing for reference.



Wherever you see the pencil has pierced the paper, or where finger prints are in evidence, or flecks of dust seem dangerously large, dab on the stopping-out varnish with a small, wornout water-color brush. Paint it on as though it were water color. It will render the surface acid-resistant. Use it wherever the ground looks as though it might not be acid-proof. In general, it is advisable to paint out sky areas, and such other locations which you wish to make certain will print white. Also, cover the entire back and edges of the plate with stopping-out varnish—don't forget this.

## SEVENTH STEP: BITING THE PLATE (12 through 18)

The plate is now ready to be submerged in the acid bath. Put the thermometer in the acid bottle to determine the temperature. If it is below 65 degrees you can raise the temperature readily and with safety, by standing the bottle in hot water *after removing the bottle's stopper*. Then pour enough acid in the tray so that it will generously cover the plate. Lift the copper plate by its edges, being careful never to touch the top surface, and put it in the acid. Make note of the time on a slip of paper. Bubbles will collect wherever the acid is biting the copper. Use the feather to swish them off gently as soon as they form. Be certain the feather is a soft one, or it may disturb the ground. If you see bubbles collecting where there should be no lines, record how many minutes the plate has been in the acid, take the plate out of the acid, and wash off under running water. Hold it on one edge until all the excess water has run off. Let the remaining moisture evaporate. When the plate is thoroughly dry, touch up the offending spots with the stopping-out varnish. When the latter is dry, put the plate back in the acid. Generally you will find that 15 minutes is a pretty good average length of time for the plate to remain in the acid. All the while it is in the bath, use the feather to dislodge bubbles. Take the plate out when the time is up, rinse under the faucet, or in a pail of water. Place it on one of the blotters. Blot the surface too—touching the surface will not do any damage now. Only the print will show whether the plate has been bitten just enough, too long, or not long enough. Keep a record so that you can profit by any mistakes.

## EIGHTH STEP: REMOVING THE GROUND (19)

For better or for worse, the battle is just about over. Place the plate on an old newspaper and pour on some turpentine. Rub it around with your finger tips. If you feel any grit, stop rubbing and rinse off with running water. If the stopping-out varnish is reluctant about dissolving, heat the plate on the hotplate, then take it off and add more turpentine. Turn the plate over and with the aid of turpentine remove all the varnish here too. Clean the plate thoroughly, using a cloth at the end. Don't be careless with the turpentine near the gas flame.

Wrap up the plate in any paper which does not contain chemicals. Take it to some friend or a plate-printer who will pull a proof for you. Take along your original drawing from which you worked, as a guide for the printer.

## NINTH STEP: RESULTS (21 and 22)

When you see the first print, don't feel elated or depressed. Take it calmly—and try again. Keep on trying, for the real sport comes in finally succeeding after a run of failures. Clients and boards-of-directors may be lured into commitments by your etching presentation. Now, before the next boom, is the time to learn etching and enjoy life.

# MATERIALS FOR SOFT-GROUND ETCHING

If you have access to a friend's etching workroom, the problem is much simplified. Better than any amount of reading, far-and-away the best method of proceeding will be to have some one show you how to manipulate the materials. If you care to do some reading on the subject, one of the best works for completeness, clarity, and brevity is that by E. S. Lumsden, entitled "The Art of Etching." If you are starting out entirely on your own, the materials described in the ensuing paragraphs are necessary. Except for numbers 7 and 9 all these materials are used for all forms of etching. Their total cost would be about five dollars, excluding hotplate (6) and copper.

## 1 —TRACING PAPER



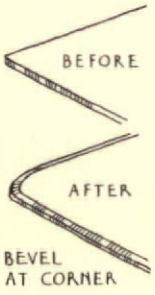
To start with, the best quality of tracing paper will give the most satisfactory results. While it should be fairly smooth, it should not be devoid of slight "tooth." Various Japanese papers will yield interesting results, depending upon the suitability of grain running in one direction more than in the other. The quality and texture of the paper will be a matter to be decided by the subject matter to some extent, because the more texture, the more the print will resemble a drawing on a rough piece of illustrating board.

## 2 —PENCILS



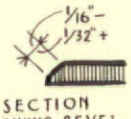
A colored pencil, such as sanguine chalk (*not* crayon), and an ordinary lead pencil about 2B grade, are all that are necessary.

## 3 —COPPER




This is sold by the square inch, and, while not prohibitive in cost, is not to be lightly consumed like sketching paper. Try out some experiments on small pieces of copper first, before doing a large job. John Sell Cotman (1784–1842) did some notable soft-ground etchings no larger than 3 by 4½ inches. The copper should be delivered to you free from any scratches, and you have a right to insist on its being practically flawless. There will be minute, multitudinous marks completely covering the surface from the mechanical polishing it has received, but these are innocuous and to be expected. Copper plates are usually cheapest when bought in stock sizes; find out what they are and have a small plate cut up, if necessary, rather than ask for an arbitrary size. Sometimes very small pieces are yours for the asking if you visit the works. 18 gauge is recommended.

## 4 —FILE




Any file which is not too coarse can be used to bevel the edges of the plate. It is well to do the filing first, so that if there are any slips of the file across the plate, your work will not be there to ruin. File the edges to a bevel so that a generous 32d, or a scant 16th, of an inch exists on the 45-degree face. Unless the edges are bevelled they will cut through the printing blankets, as well as the paper, when printed.

## 5 —CLEANING AGENTS




Unless the copper surface is absolutely free from all impurities such as grease, the ground will not adhere and the whole process is doomed to failure. There are various means of rendering the copper quite clean, but the following materials are easily obtainable, inexpensive, and will do a thorough job. Get ordinary gilder's whiting, put some in a medium-sized dish or bowl, and moisten it with a solution of water which contains enough ammonia so that you can smell it (5 per cent solution in water is ample). Keep this solution in a glass-stopper bottle. In another container make a solution of vinegar and salt; a teaspoonful of salt in about a half-pint of vinegar is ample. Have two old pieces (about 3 to 4 inches on each side) of thick flannel, felt, or like durable material, with which to apply them.

## 6 —HEATING PLATE




In laying the ground the usual etching equipment includes a "hotplate," which is merely a sheet of metal on a frame having legs, and supplied with a gas-ring underneath. Lacking this, use your ingenuity in rigging up a cake-tin, or something in the nature of a piece of sheet metal, over the gas range. Turn on the gas flame only a small amount, or the heat will be too concentrated in the centre, and too hot for your purposes. The heating plate should be large enough to allow you to work comfortably, perhaps 12 by 18 inches, and firm enough to afford a sound foundation for the dabbing you will do. A table in close proximity will be necessary.

## 7 —WAX GROUND




If you can purchase a "ground" especially made for soft-ground etching, it will save time and trouble. Otherwise get Rhind's standard ground, also a piece of mutton fat about the same size (cut it off before the chop is fried for dinner), and melt the two together in a small, clean, cooking utensil. Before it hardens from cooling, mould it into any shape, wrap a piece of silk, muslin, or other cloth material, around it, and tie the gathered ends together. When used on the copper this cloth casing will make it easier to hold and to manipulate. In warm weather perhaps one-third mutton fat with the ordinary ground, may be better than one-half.




## 8 —DABBER OR ROLLER

In order to lay the ground you will need either one of these two. The dabber will cost less, and can be homemade if you care to do so; it is perhaps the more easily manipulated, once you get the hang of it. Don't use this particular dabber for laying an ordinary ground later, but reserve it for soft-ground etching only.

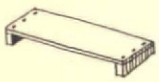



## 9 —PASTE




The tracing paper can be thumb-tacked around the edges of the plate, but there is always the likelihood of one or the other moving. In a landscape this may not be detrimental, but in an architectural subject it may do considerable damage. Therefore use paste, or better still, rubber cement, to hold the tracing securely in place (see Fourth Step).

## 10 —HANDREST





While working on the plate after the ground has been laid, it is of the utmost importance that *nothing* should touch the surface. If it does so that the ground is disturbed, remove the latter with turpentine, clean the plate anew, and relay the ground. When the tracing paper is fastened in place, nothing except the pencil must be allowed to touch the paper. If your finger imbeds the paper into the ground, it will have the same effect as though you had done so with a pencil point, and the evidence will show on the print. Therefore, in order to draw with absolute freedom, it will be advisable to have a handrest, unless the plate be so small that you can reach all parts of it easily without making your hand stir from a single position. Take any piece of thin board, like three-ply wood, and nail cleats at the ends. If the cleats hold the board a half-inch above the table top, it will be sufficient. Don't have them so far apart that the board will sag in the centre and "let you down." A slight downward, forward slope of the cleats may be of advantage.

If you don't want to go to the trouble of making a handrest, use any stiff, thin board and let it rest on two cleats or books at the sides of the plate.

## 11 —STOPPING-OUT VARNISH



Get a small bottle of this quick-drying varnish; it will cost about fifty cents. It can be applied to the plate with worn-out water-color brushes, very small ones for delicate touches, and a large one for painting on large areas, such as the back of the plate. Some products are not rapid in drying—get a type which is. Rhind's is one of the best. Don't ever plunge the plate into acid or water until the varnish is thoroughly dry.

## 12 —ACID




For this type of etching the nitric bath is best, because when the copper is submerged in it, bubbles will form wherever the acid is biting. Consequently, if there have been any finger prints, or other accidental marks, they will disclose their existence. Then the plate can be taken from the acid, and these spots blotted out with varnish as described in the Sixth Step. In making up the acid solution, a good working proportion will be to use 3 parts of nitric acid to 5 parts of water; a 32-ounce bottle will give you a good working quantity. *It is of the utmost importance, in mixing acid and water, to add the acid to the water*, not the reverse. Otherwise there would be so much heat generated that the glass container will likely crack, among other disasters. Keep the acid in a glass bottle having a glass stopper. Often the latter has a way of refusing to come out; put a cloth in hot water, then wrap it around the bottle top, and after a little heat treatment of this sort it will yield readily. Don't try to force the glass stopper.

## 13 —THERMOMETER




After several years of etching you may be able to judge how well the acid is biting, by taking the plate from the acid and squinting against the light to determine the depth of the bitten areas. But for the first few years a thermometer is a valuable aid. Acid will work for you best between about 65 and 70 degrees Fahrenheit. Experiments will be of great aid to future plates if you record what the temperature was when you bit the plate. Later on you may meet a similar problem where this information will supply the correct answer at once, instead of guessing badly and being compelled to do it all over. It takes only a moment to jot down the conditions under which a plate is bitten, while it may take days to make over an entire plate.

## 14 —TRAY



The container must be acid-proof, so don't use enamel ware over metal, unless you give it several coats of acid-proof enamel or lacquer first. Any rectangular porcelain or china tray that has a flat bottom will do admirably.

## 15 —FUNNEL



In order to pour the acid from the tray back into the bottle you will need a funnel; get a glass one preferably.

## 16 —FEATHER



Take one or two soft ones from a duster, or other source.

## 17—BLOTTERS

At various intervals along the way these will be necessary. Get them white and of the most absorbent quality possible. Sometimes desk blotters do everything except absorb moisture.

## 18—RUNNING WATER

The business of placing the copper plate in, and removing it from, the acid, is best done in the vicinity of running water. If you drop acid on the plumbing-fixture enamel, fittings, etc., wash it off promptly before it stains them. It delights in attacking clothes and shoes, taking out the color and making holes. Be most careful not to splash any on your face, particularly in your eyes. Half-strength nitric will not hurt your hands as you merely manœuver the plate in and out the acid bath, providing you wash it off immediately. Use rubber gloves if you have any open cuts, or the acid will burn smartly.

## 19—TURPENTINE AND CLOTHS

The latter should be free from grit, buttons, hooks-and-eyes, etc.

## 20—SMOCK

When it comes to the acid operations it is advisable to wear something to protect your clothes. Have your sleeves rolled up and out of harm's way.

## 21—PATIENCE

This is an important ingredient, and quite essential if your first experiment is not to be your last. Approach soft-ground etching as a game that requires a certain amount of technique before you can conscientiously expect to put over blazing aces. If your first small experimental test plate is not what you expected, it will augur better for future success than though it had turned out so well that you felt there was not much more to learn. Every plate is a new adventure, and while past experience is of inestimable value, there will always be sufficient new problems to keep your interest intense.




## 22—LUCK

Don't try to lay in a supply. There is occasionally some to be had in etching, but not much. The laws of chemistry are immutable, not temperamental. For example: the copper is clean and the ground stays on, or the surface is greasy and the ground comes off. There is no luck one way or the other. The tracing paper is put on carefully so that nothing but the pencil point touches the paper, or it is put on carelessly and finger prints show up on the print. Just a matter of technique—not luck. From a small test plate you find out how long the plate should remain in the acid, or you make a poor guess based on no information at all. That is a matter of taking an hour's time to find out, not a lack of luck. Where luck sometimes does figure, however, is in this manner: In a small test plate you decide that a certain degree of pencil blackness on the tracing paper will give exactly the tone you want, after the plate is bitten fifteen minutes. Then, without realizing it, you bear down on the pencil a bit heavier than you realize, the rising temperature of the room makes the ground adhere to the paper more than it did on the test plate, and presto! the print shows that while all is blacker than you intended, the thunderous effect is an improvement over your paler study. Or, perhaps a thumbmark gives a foreground smudge which is a better imitation of a dried-up mud-puddle than you could have drawn.

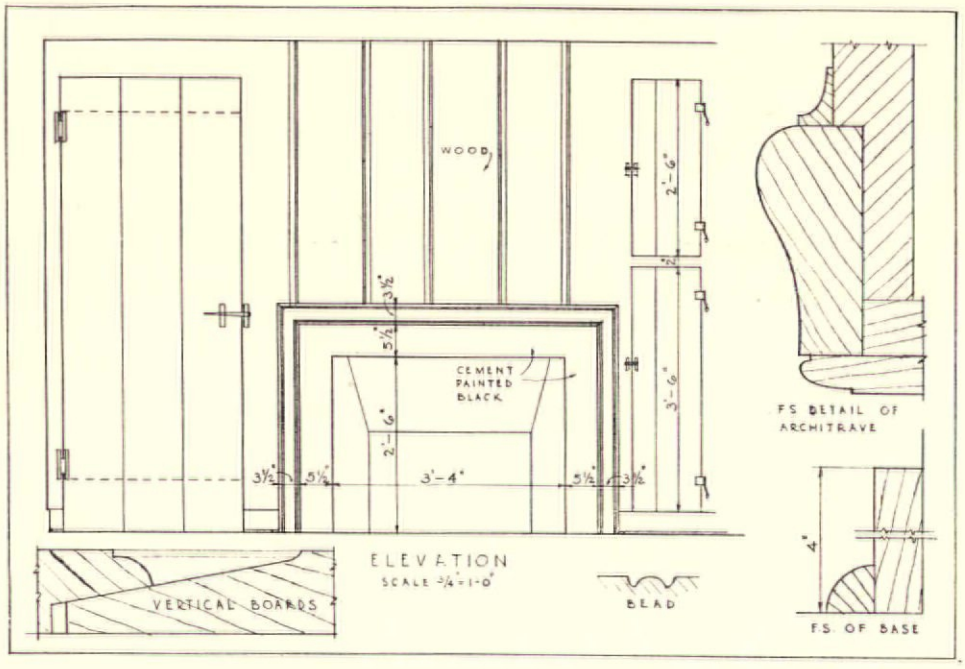
Reproducing at the original size a portion of the soft-ground etching in color, "Rue St. Jacques," by T. F. Simon



*By courtesy of Kennedy & Company*

# FAVORITE FEATURES

## CHARLES S. KEEFE




*In almost every piece of work that an architect designs there is, when it is finished, something that he would prefer to have otherwise. Once in a long while, however, he rings the bell so clearly that even his sophisticated eye finds it good. The architect tells himself that it worked out as he has hoped, and he would not change it if that were possible.*

*Here is another in this series of "Favorite Features," a bedroom chimney corner in the guest house of Constantine Hutchins, Needham, Mass., which satisfies Mr. Keefe*



# The Editor's Diary

*Friday, March 31.*—Lunched with H. T. Lindeberg, discussing the myriads of efforts toward standardization in building. Two things stand out as rather obvious facts: first, that standardization in building must concern itself with units of construction rather than with buildings as a whole—at least, above the size of a gasoline-filling station or portable garage. Second, a real progress in the achievement of proper standardization of parts is very definitely handicapped through the fact that each industry, if not each individual manufacturer, is trying to make a material or a device out of the raw materials with which he alone works. There is no correlating agency to select and further the most likely combination of materials and methods; just as there is no one to persuade the lumber industry, for instance, that it is wasting its time and efforts in attempting to prove that one should build a house out of nothing but wood.

*Saturday, April 1.*—Chicago's North Shore Real Estate Board recently conducted a competition for the design of an "average American home" with a first prize of one thousand dollars which was awarded to Robert S. Arnold, of Winnetka. The jury, in its report, bewails the fact that it expected one thousand entries and got about one hundred. There seems to have been something wrong with the publicity. The sponsors say that they notified every chapter of the A. I. A., and *The Chicago Tribune* gave the matter considerable mention. Nevertheless, so far as I can find out none of the architectural magazines was invited to help spread the news, so that the competition naturally remained a local matter.

*Monday, April 3.*—Robert D. Kohn has almost acquired the status of a commuter between New York and Washington where he has been in close touch with Senator Wagner; Lester Douglas, Director of the Budget; and Miss Frances Perkins, Secretary of Labor, working toward the inauguration of a really comprehensive construction programme to put the unemployed back to work. Mr. Kohn figures that we have lost practically a year in our failure to take advantage of the provisions of last year's Wagner Bill, and that even more forceful measures are now necessary. Incidentally, he brought before the leaders in Washington a detailed list prepared by the National Committee for Trade Recovery of more than two and a half billion dollars' worth of planned public improvements delayed or abandoned because of the depression, and probably in large part ready for inclusion at once in a public works drive on a war basis.

*Wednesday, April 5.*—Tonight the New York Chapter, A. I. A., awards to Louis Ayres, member of the firm of York & Sawyer, its Medal of Honor in recognition of "his prominent part in the many distinguished designs produced by his firm that have contributed to the moulding of public taste and to the honor of the profession, and for his faithful service to the public as a member of the National Fine Arts Commission"—a particularly popular and well-deserved award.

Julian Clarence Levi, retiring president of The Architectural League of New York, and chairman of the Architects' Emergency Relief Committee of New York, has, as many of us know, worked night and day in the past two years in a sustained and effective labor for others. The Chapter expresses its recognition of his tremendous and productive efforts in its citation read in tonight's annual meeting:

"The crisis through which the world is now passing has brought to many of our profession great privation and distress, the alleviation of which has become our chief concern.

"The work of relief has been organized and administered with so much sympathy, energy, and untiring devotion by one of our members as to merit our warmest approbation.

"As an expression of our grateful appreciation of this eminent service to his profession and his fellow men, the New York Chapter of the American Institute of Architects desires upon this occasion to bestow its highest commendation on Julian Clarence Levi."

*Thursday, April 6.*—The A. I. A. Board of Directors straddled the fence very neatly in their statement that the Board "recognizes and commends proposals for mass or factory production of small houses. Nevertheless, attention is called to the danger of obliterating the individuality and character of the house . . ."—which double statement might have been combined possibly in the more tenable theory that progress in housing will result from standardization of construction units rather than from standardization of houses, whether they are large or small.

*Saturday, April 8.*—Robert Wiseman is prompted by the reading of Carleton Ryder's articles to express his amusement over the position in which the philosophers and the scientists find themselves. Wiseman has been listening to some lectures by John Dewey in which the latter holds that experience is the only truth we know. At the same time he has been reading Max Plank, the German physicist, who arrives pretty nearly at the conclusion that human experience can go only so far, and then we must assume a truth until it is disproved. Wiseman finds very amusing the fact that the philosophers are, at the moment, putting their faith in the proving of facts, while the fact-finding scientists are apparently coming around to doubting the practicability or even the possibility of arriving at facts.

*Monday, April 10.*—J. C. Knapp, vice-president of the Otis Elevator Company, in a speech before The Architectural League today, voiced a hope which has for long been a pet one of ours. The architect who designs a building should, as a matter of course, continue his interest in the structure during its lifetime. As a specialist in buildings, and particularly in that building, the architect is best qualified to suggest changes and improvements to maintain its useful life. Of course, something like this is the case in England and in France. Perhaps we are at last coming to it.

*Wednesday, April 12.*—Frederick Heath, Jr., writes me that a photograph on page 227 of the April issue takes him back to about 1919. The illustration showed some scored hollow tile used in the wall of the penthouse on The Mission Inn at Riverside, Calif. Mr. Heath tells me that these brick were "Heath Units" as invented by his father, Frederick Heath, a Tacoma architect, some time prior to 1913. They were manufactured by the Los Angeles Pressed Brick Company, now Gladding McBean & Sons.

*Friday, April 14.*—W. E. Emmett, District Engineer at San Francisco for the American Institute of Steel Construction, reports that his investigations following the earthquake indicate that steel apparently held the record for stability. The only fallen piece of steel evident in the vast area of store buildings was an I-beam that dropped when the entire brick front and sides of the structure fell. On the other hand, many steel lintels are visible, due to the fact that the brick fire-wall was not properly anchored. There were some examples of brick construction badly wrecked, the fault apparently not of brick, but of poor construction. The highest structure in Long Beach, the Villa Riviera Hotel and Apartments, is of steel-frame construction, designed for dead and live loads

and fifteen pounds of wind. It came through with only a few plaster cracks.

*Monday, April 17.*—There is food for thought in the fact that while a sophisticated jury awarded the prize to a very modernistic flat in the Marshall Field Apartments, Chicago, the five thousand lay visitors voted overwhelmingly for a period room. The modern flat was designed by Mrs. John Root, with unfinished mahogany furniture and a yellow color scheme with white Venetian blinds at the windows. On the other hand, the popular vote was for an eighteenth-century English suite designed by Mrs. A. C. Cramer. The choice of the most livable apartment as voted upon by the public lay between an early American style, one combining Beidermeier and Directoire motifs, the English eighteenth-century, and the modern one.

*Tuesday, April 18.*—Dropped in to see Henry Wright, only just back from studying housing abroad. Foreign methods of living differ materially from ours, and their housing must necessarily differ from ours. Nevertheless, there are lessons in the fundamentals that we may learn from their longer experience in government-subsidized work of this kind. These lessons, as Wright sees them, will soon be made available to the profession.

*Wednesday, April 19.*—O. H. Cheney, who directed the national survey of the publishing industry two years ago, has of late been devoting his analytical efforts to the building industry. Mr. Cheney's concrete suggestions are not particularly new, since many of us have been urging this sort of thing for months. Nevertheless, he does bring the problem out into the light of specific inquiry with the following twelve questions, suggested as the necessary preliminary to an immediate advance.

"What is the present supply of available accommodations in each class of building and use?

"What is being actually added and what planned?

"Exactly where are these old and new supplies?

"What economic and other influences are now at work which might affect particular neighborhoods and buildings?

"Is there a danger of oversupply of a certain type of accommodations in a given neighborhood?

"Of what kind of accommodations is there an inadequate supply and where?

"Why are tenants moving in or out of certain buildings or areas?

"What competitive accommodations are being offered in other parts of the city or metropolitan area?

"What are current returns on various types of property in various areas, and what are the causes of differences?

"What buildings are ready for demolition and what areas are ready for rehabilitation?

"What facts are necessary to determine the best use of any given piece of property?

"What are the extent and causes of current vacancies? (Not the sketchy, inaccurate and misleading so-called vacancy surveys which so many real estate organizations have made.)

"'With such facts at their disposal,' Mr. Cheney observed, 'owners of projected property need not be blind as to prospective returns and builders need not be blind as to the market for construction work.'"

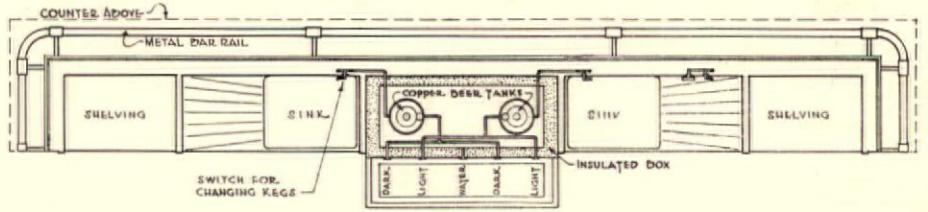
*Friday, April 21.*—Pierre Blouke in from Chicago by way of Washington, with the news that Chicago is, if possible, even quieter than New York, architecturally. He says the Fair is going to be worth seeing. Blouke, by the way, has just designed a sizable country house to be built with an exterior of copper, using for color contrast the silver gray of lead-coated copper, and the bronze that copper rapidly acquires. For pattern he is making use of the standing seam.

*Saturday, April 22.*—Diego Rivera seems to be leaving a trail of argument behind his mural painting as he proceeds from New York to Detroit and back again to Rockefeller Center. In Detroit his work in the garden court of the Institute of Arts is being attacked as being "communistic," "irreligious," and "satirical." In New York the newspapers are making gay over their contentions that Rivera is putting over, at Mr. Rockefeller's expense, propaganda for communistic ideas. All of which is probably the usual product of news gathering when real art news is scarce. Nevertheless, my own feeling is that Diego Rivera is a good painter—in Mexico.

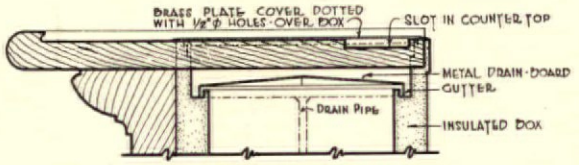
*Monday, April 24.*—George Sakier showed me today his carefully studied scheme for standardizing bathroom equipment. Sakier has taken a long step beyond the present state of affairs, in which plumbing fixtures are the commodity. In this new conception the bathroom is the commodity—not a fixed unit, but a series of wall panels in metal with which are incorporated the plumbing fixtures themselves. The scheme is so elastic that one may install a bathroom in an old building without breaking into the walls. In a word, it is a bathroom in sectional wall units which are easily joined, arranged in a multitude of combinations, and beautifully finished with the color baked directly on the steel. In these sections are combined not only the essential plumbing units, but medicine cabinet, lighting fixtures for over the lavatory, all the usual bathroom accessories, heat duct openings, and ventilating grilles. In other words, a plumber and a carpenter can assemble a bathroom complete almost as easily as one can now install the kitchen dressers.

*Wednesday, April 26.*—Hobart Upjohn was host to a distinguished company at dinner tonight at The Architectural League. The occasion was unique, and long to be remembered by all who were privileged to attend. Here was the celebration of one hundred years of architectural practice in a single family. Richard Upjohn, whose best-known work is Trinity Church at the head of Wall Street, New York City, was born in Shaftesbury, England, in 1802. He came to this country in his twenties, and soon attained recognition among the leaders of his profession. He found The American Institute of Architects in 1857, and served as its president for sixteen years thereafter. Richard M. Upjohn, his son, who was a contemporary of Richard Hunt and Stanford White, designed among other works the Connecticut State Capitol and the old St. Thomas' Church at 53d Street and Fifth Avenue, New York City. He had five sons. Four of them tried to follow in their father's professional footsteps, but found it hard going under a master who believed in a rigorous enforcement of traditional apprenticeships. Hobart Upjohn, the youngest of the sons, approached architecture from the engineering school. His latest church, All Souls, New York City—a distinguished work—is one in a long line of more than one hundred Upjohn churches in the United States, largely in the east and south.

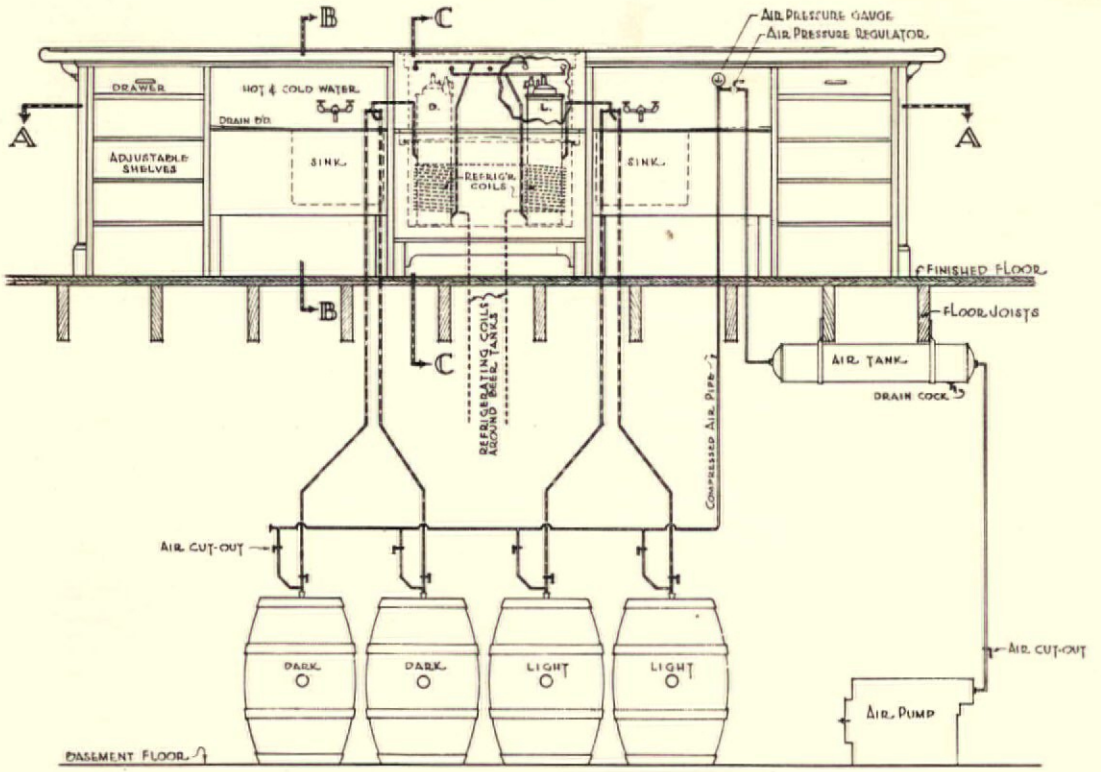
Among the distinguished guests at the dinner were Dean Milo H. Gates of the Cathedral of St. John the Divine; former Governor William T. Gardiner of Maine, for whose grandfather Richard Upjohn built one of his first country houses; Royal Cortissoz; Dr. Ralph Adams Cram; Charles H. Higgins, president of the New York Chapter, A. I. A., who presided as toastmaster; Julian Clarence Levi; J. Ernest Russell, president of the A. I. A.; Dean William T. Boring of Columbia; D. Everett Waid, past president of the A. I. A.; and others to the number of fifty. Unfortunately I was compelled to leave the dinner before some of the speeches which, as a whole, constituted a love feast in praise of architectural tradition. Cram and Cortissoz, among sympathetic friends, voiced with all their vehemence the further development of traditional forms as the only tenable road of progress for architecture.



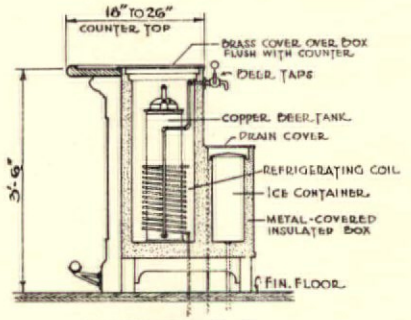

·PLAN·A-A·



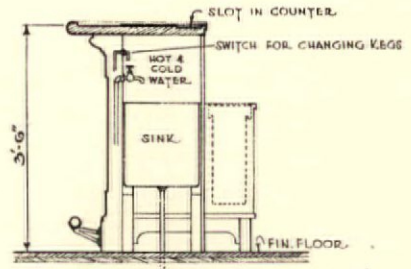

COUNTER SECTION




·REAR·ELEVATION·




·SECTION·C-C·



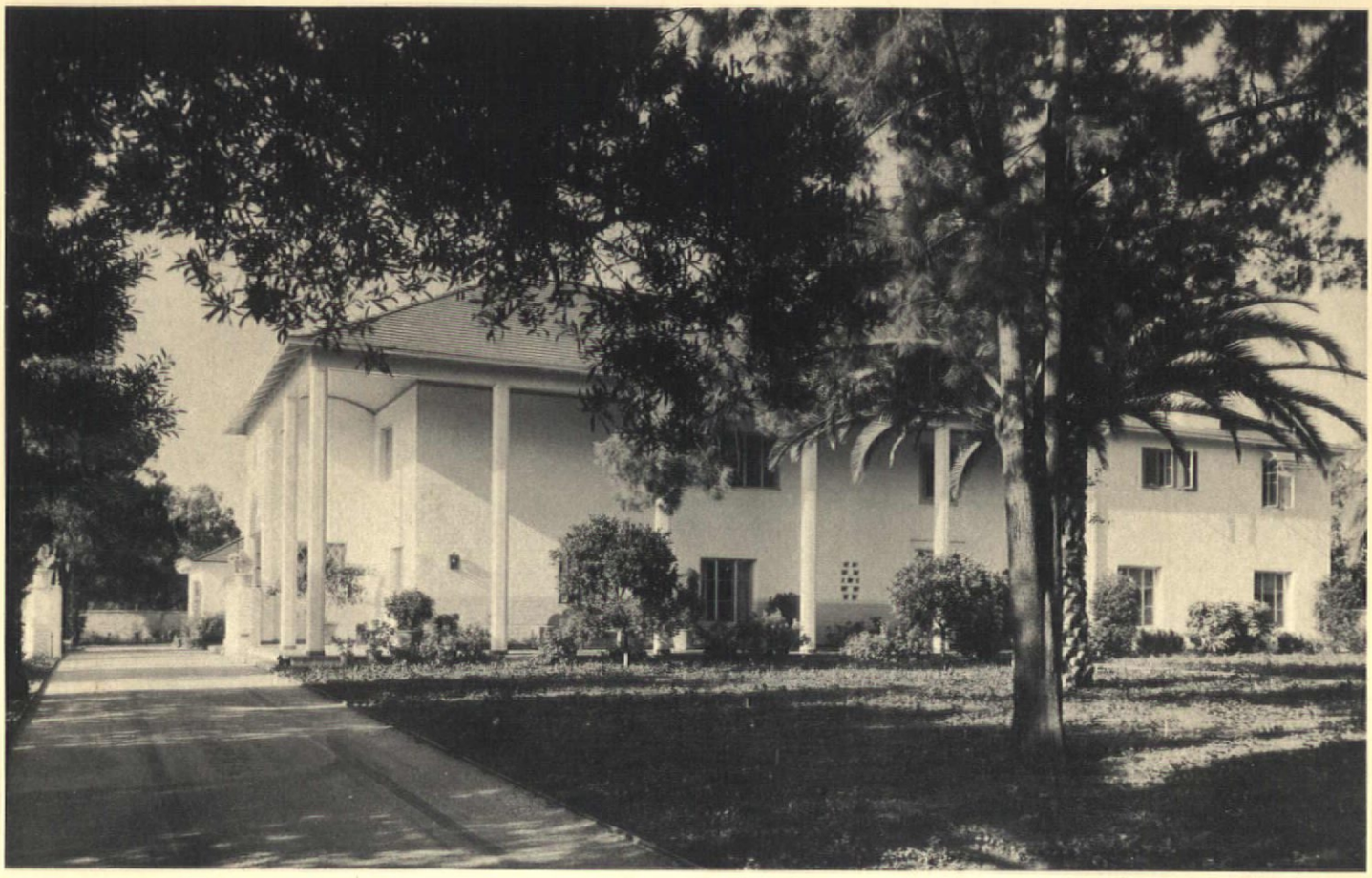

·SECTION·B-B·

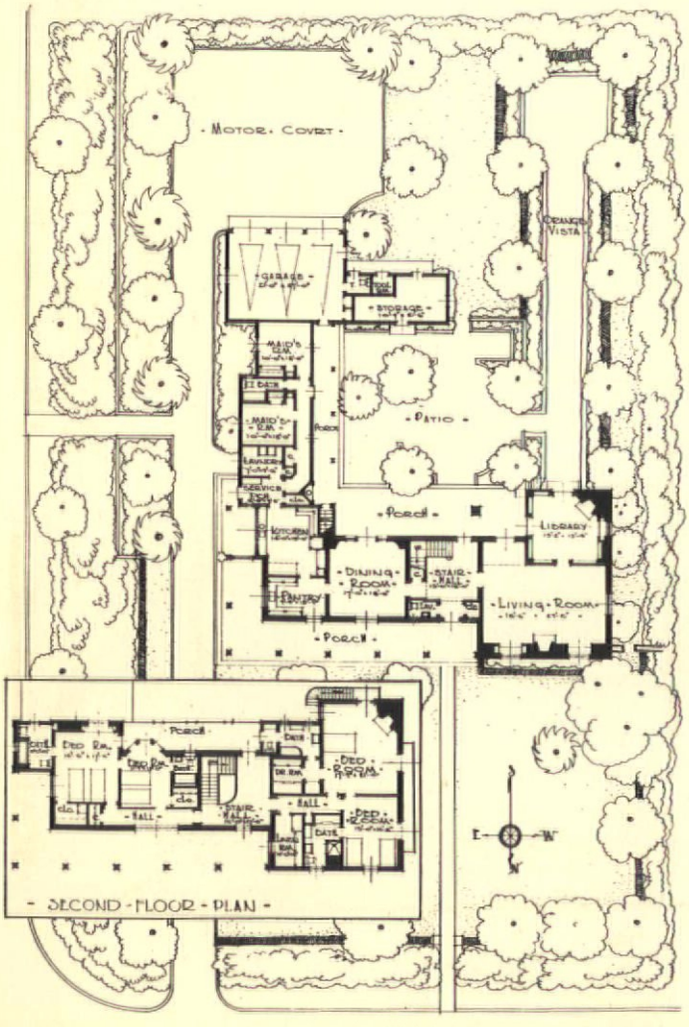
# ·DETAIL·OF·BAR·CONSTRUCTION·

·SCALE: 0 1' 2' 3' 4' 5' 6' 7' 8' 9' 10' 2'0" 3'0"

A SERIES OF WORKING DRAWINGS BY JACK G. STEWART

·PLATE·№·37·






*One of the most interesting features of this house is the color treatment of the exterior. The dado, which shows very indistinctly in the above photograph, is green with a dull yellow band at the top. Elsewhere the exterior walls are white, but the ceiling of the porch is also green with a darker green band outline, and the small cement bases of the columns are the same green. The roof is pure blue*

*Photographs by George D. Haight*

# House of Edward H. Heath, San Marino, Calif.

ROLAND E. COATE, ARCHITECT



*A detail along the side of the house at the driveway entrance. The glazed terra-cotta ornamental pots are greenish blue, holding cactus of terra-cotta color*



*A corner of the patio, showing under the roof the flower sink lined with green and yellow tile. The steel casements are painted a straw color*



*At left, a detail of the porch along the north front. The walls are of stone tile, painted white. The green ceiling with its darker green border is vaulted*

*At right, the library fireplace. Incidentally, here may be seen an ingenious scheme of framing for the purpose of reconciling a horizontal composition to a vertical panel space. This house was awarded a prize in the House Beautiful Contest last year*

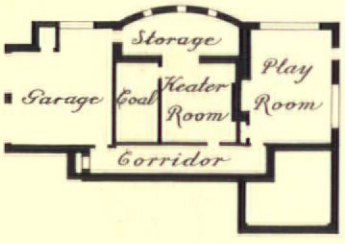




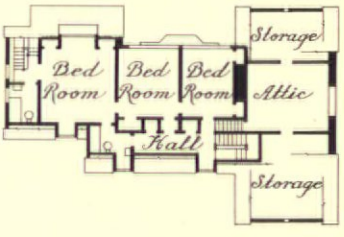
*The north front and entrance garden. On the other side, the south, the land drops abruptly to the valley of Crum Creek, about 150 feet below*

# House of Edward Wright Moylan, Pa.

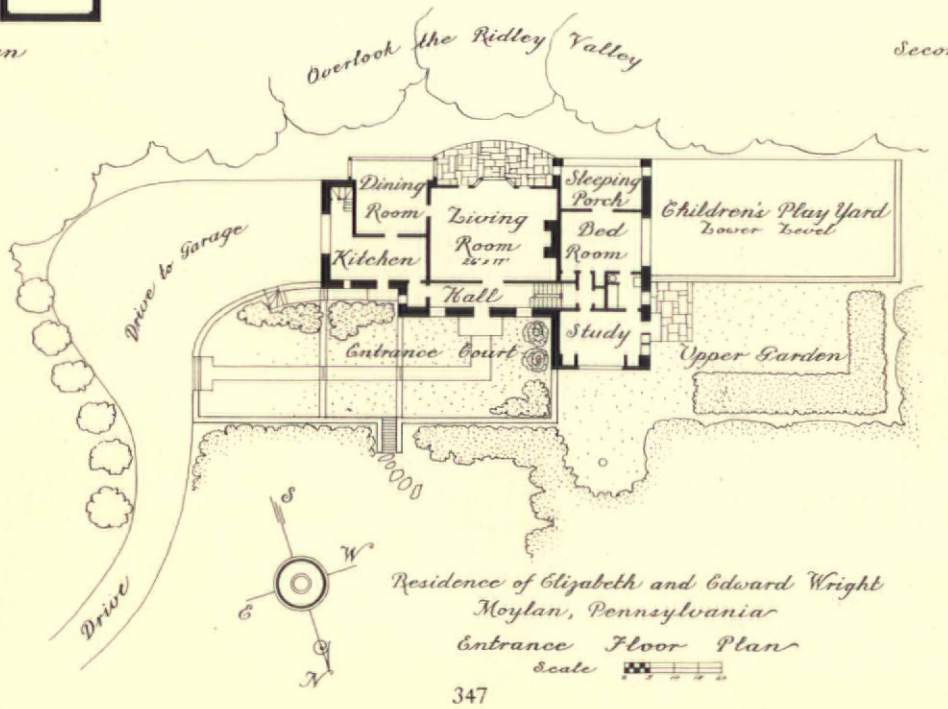
DAVIS, DUNLAP & BARNEY, ARCHITECTS




Basement Plan




Second Floor Plan




Residence of Elizabeth and Edward Wright
Moylan, Pennsylvania
Entrance Floor Plan
Scale

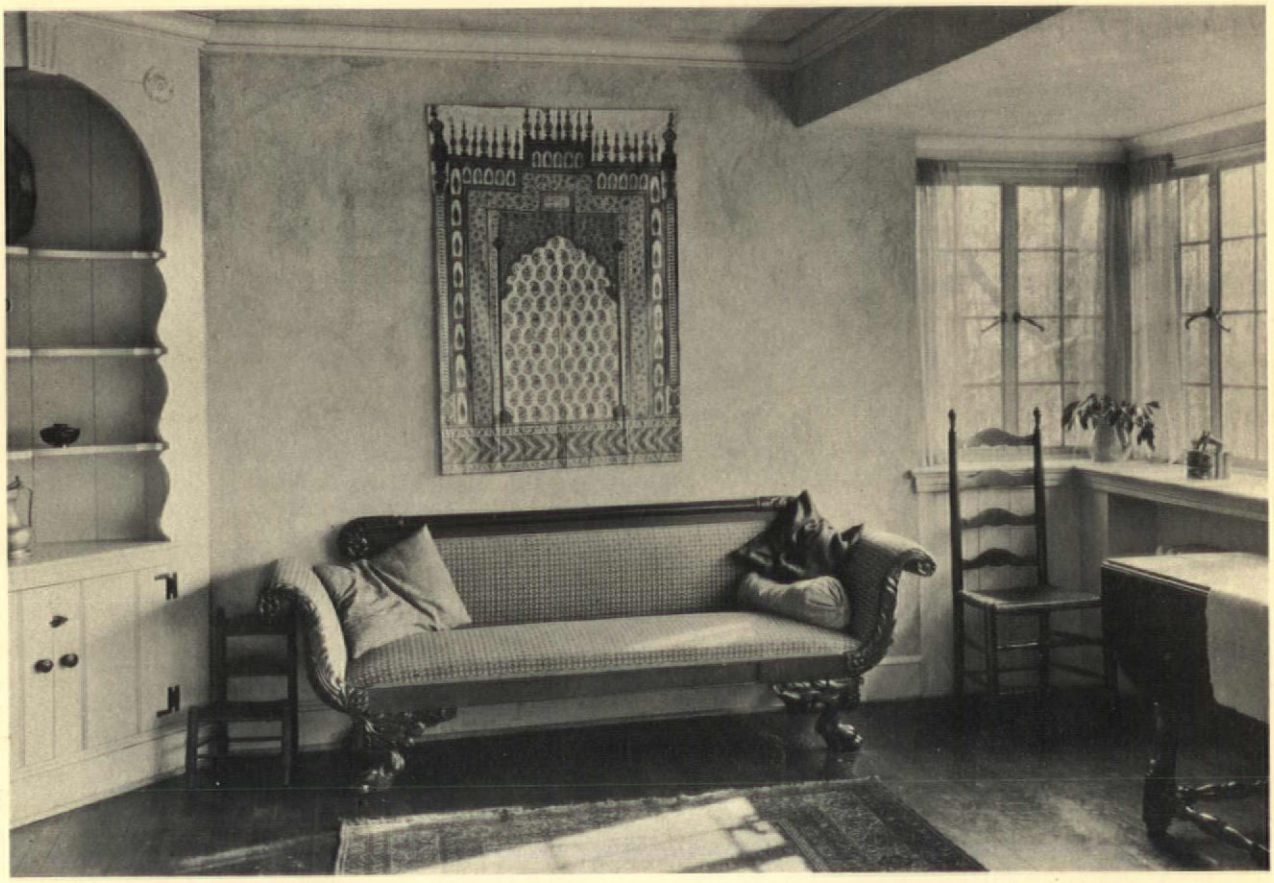


*Two views of the living-room. Virtually the whole south side of this room is taken up by a range of casement windows. The fireplace is faced with native stone. Walls are of sand-finish plaster, tinted buff. All the woodwork is cream*





*Main entrance on the north side, the carved date stone above the door being of limestone bearing a cipher devised from the names of the owners*



*Above, the dining-room. Here again the entire south side of the room extending around the corners is opened up by casement windows. Below, the children's playroom on the basement level at the west end of the house. The steep slope permits here, also, long ranges of casements on the south and west*



# Some Pitfalls in Supervision

## *By W. F. Bartels*

XXXII. MECHANICAL APPURTENANCES

(*CONTINUED*)

THE control board for the pumps must be clear of all water lines, and not under locations where serious leaks may occur without due precaution being taken for the protection of the board. It is advisable to provide that *both starters may control either pump*, if two pumps are provided. Particularly is this true of sump pumps. To illustrate: let us number the pumps 1 and 2, as well as their starters numbered 1 and 2. If *starter* 1 breaks down and *pump* 2 breaks down, number 2 *starter* can operate number 1 *pump*. This is a very simple matter to arrange and the cost is negligible as compared to the margin of safety it affords. In short, by means of a throw-over switch number 1 starter will operate either pump, as will also starter number 2.

The superintendent should secure the approval of the design and location of the pump foundations before he permits the contractor to proceed with the subsequent installation. The contractor is apt to argue that if the pump is a good one it will be balanced, have little vibration, etc.; but the instructions of the manufacturer should be meticulously adhered to. Any special features, such as cork foundations, should be carefully carried out according to details.

The capacity of the pump is important in relation to the work it is expected to perform. It should first be checked against the manufacturer's rating book, to make sure it is the one ordered. Then the head against which it must work, if it is pumping fluids, should be checked. Many times the plumber figures the head from the bottom of the tank or the floor. This obviously is incorrect, because the water enters the top of the tank, and in some special instances might have to go higher in order to get into the tank. A test should of course be made to check the capacity, at which time other items, such as bearing temperature, speed, etc., may also be investigated. If run by electricity the motor and pump should be connected by a flexible coupling so that the errors of the human element may be kept to a minimum in aligning the drive shaft. A slight amount of disalignment here will cause all sorts of trouble later. It is a good plan, when two pumps are installed for the same purpose, and where one is regarded as a spare, to have them so arranged that they alternate automatically. This keeps both pumps tuned up and the man in charge can always be sure that the other one will work if it is called upon to do so.

The superintendent should see that all spare parts called for are furnished, and that the engineer who will be in charge is thoroughly acquainted with all aspects of service that will be necessary for the continuous and efficient operation of the pump. It is important—extremely so—to know how far away the nearest service station is, and how soon help will come when needed in an emergency. Many a dealer with a good pump has lost a sale because the answer to this question was not satisfactory.

The smooth functioning of a pump is to be desired, but because it does work well is no reason for overloading it. On the other hand, some types should not be underloaded. For example, a centrifugal pump working against a lesser head than it was designed for is inclined to race, with the resultant consumption of unnecessary power and possibly burned-out windings. While pumps must be run to do the work required, good practice demands that the pump be not run more than 35 or 40 per cent of the time without being given a rest. The connections from a pump delivering water should not be at sharp angles, nor should there be more angles in the line than are absolutely necessary. The reasons for this are obvious.

The testing of pumps has been mentioned, where there was a receptacle to catch the water. Where there is none, and a test must be made, such as a test of a fire line on a roof, an instrument known as a Pitot tube is used. This tube gives the pressure with which the water is leaving the hose nozzle; knowing this and the size of the nozzle, the amount of water may easily be computed. The tube is a hook-shaped affair, the end of which is put over the discharging nozzle.

In the testing of fire lines on a roof I once

encountered an interesting fact. The pressure was well up on the pump gage; the valve at the hose was turned on, but no water appeared. Telephoning the engineer, the latter reported a steadily mounting pressure. Still nothing resembling water appeared at the hose end except a sorry dribble. Cutting the pump off and taking the last connection off, it was found that a workman's leather glove had gotten in the fitting and was effectually cutting off the water and causing the plumbing contractor no little worry.

If the superintendent is not familiar with motors he should not hesitate in asking assistance when inspecting them. They are complicated if inspected minutely, and none but an expert can detect all of the hidden or likely defects. The manufacturers as a whole do not wish to misrepresent or deliver a product that is unlikely to give satisfactory service. But this does not prevent an unscrupulous dealer from switching name plates or anything else that may suit his convenience or profit. Most motors have a plate put on them by the maker, giving the pedigree of the article. Motors are generally 40° or 50° Centigrade. This means that in four hours continuous running they will not heat up more than 40° or 50° C., respectively, above the room temperature. Of course they must not be expected to perform this in a very small room without ventilation. A superintendent was once on a job where a majority of motors were 40° C. Coming across one that was well covered, but at its visible points had a shabby appearance, he looked more closely at its tag. It was a 55° C. motor. Checking back against the specification, he found it loosely written at this point and of no definite requirements except to provide for "a motor twice as strong as necessary to do the work." The question arose as to what the amount necessary was to do the work. Feeling that a technical advantage had been unjustly taken, the superintendent third-degreed the contractor. The latter finally admitted that not only was the 55° C. wrong, but that the entire plate was incorrect, and that the motor had been rewound. Finally after much guaranteeing and verbosity as to the soundness of the motor, it was installed, but it is doubtful if the owner really got what was intended by the specification writer. Then, too, the horsepower of a motor may be changed (as far as a superficial inspection goes) by changing the plate. Thus a motor with a certain rated horsepower at 40° C. may be stepped up in horsepower by changing the plate to read 50° C. These methods and tricks are not resorted to by the well-known manufacturers, but by the unscrupulous firms interested only in quick profits and a quicker getaway.

When the motor is tested it should previously have been running at least two hours. Then its revolutions should be measured by means of an instrument called a tachometer. The voltage should be read, as well as the wattage and amperes.

The following story will illustrate what care a superintendent must exercise. I was to witness the testing of a motor by the contractor's "electrical expert." Various features of the machine were tested, but no watt meter was in evidence. Thereupon I asked that one be produced in order to ascertain the wattage. Imagine my surprise when I was told that it was not necessary to know the wattage, because they could work back from the assumed factor of the motor and arrive at it. But it was this assumed factor of the motor that was to be determined, and hence the wattage was necessary in obtaining this. What the "electrical expert" either did not know or "lost sight of" was the fact that I desired to have it proven to me that the stated efficiency was correct in order that the owner's maintenance bills should not run higher than necessary. Such seemingly insignificant factors, while not stupendous in themselves, mount up if not checked, until the owner is eventually swamped with costs, and wonders why he is making no profit on a supposedly first-class job.

CONTACTS

DEVOTED TO A BETTER UNDERSTANDING OF THE BUSINESS SIDE OF ARCHITECTURE AND ITS RELATION TO THE INDUSTRIES

# A Constructive Policy for the Construction Industry

*By Lewis H. Brown*

President, Johns-Manville Corporation

THE construction industry, taken in its broadest sense, is one of the largest industries in this country. To adequately outline a constructive policy for this great industry in such a short time allotted, calls for brevity and condensation.

In order that we may get a perspective of the building industry, may I take a cross-section of it—a typical city—the city of Chicago, Ill., and, using building permits as a measure of activity and extent of the construction industry, give you a thumbnail sketch of what happened.

In 1882, building permits in the city of Chicago amounted to $16,286,700. The average per year in the 1880's was $21,000,000.

In the decade after 1890, the average per year was $35,000,000, the increase being stimulated by preparation for the World's Fair. In the last year of the decade, building permits were $20,000,000.

In the next decade, beginning with 1900, the average building permits per year were $53,000,000, increasing every year and reaching a top figure of $90,000,000 in 1909.

The next ten years covered the war period. The average was $87,000,000 per year. In 1911, 1916, and 1919 building permits exceeded $100,000,000 per year. 1917 and 1918 were relatively poor years for this decade.

But in the next decade, from 1920 to 1929, something happened. The average normal building permits were $265,000,000. Even for the two years of the terrible depression of 1920 and 1921, the average was over $100,000,000 a year. From then on during the remainder of the decade, nothing less than $200,000,000 or $300,000,000 figures were tolerated. 1926 was the peak year with $366,000,000 of building permits in the city of Chicago only.

*Mr. Brown rearranges and revivifies our perspective of volume in construction—what it is, what it has been, and what it may be. The article is adapted from his talk on March 16 last before a joint meeting of the Producers Council Club and the Architectural League of New York.*—EDITOR.

What happened to the construction industry? Something certainly did happen. Most of us are inclined to answer that question with a statement about housing shortages created as a result of no building during the war. But this is one of those fallacies of history.

In Sinclair Lewis's latest book, "Ann Vickers," one of his characters, an instructor to a group of young ladies in a girls' school, tells them that they have all heard about the "Fall of Rome." Then he tells them the various reasons advocated by various people as to why Rome fell. And then he tells them that that's another fallacy; that, in fact, Rome never fell. Rome simply changed. At the height of its glory, it was a little city. Today it is the tenth largest city in the world.

And so what happened to the city of Chicago, in reference to the construction industry, was what happened to the construction industry all over the country.

In the first twenty years of this century a new means of transportation was made available to the people. And just as a new means of communication had revolutionized the world in the decade preceding, this new means of transportation—the automobile—revolutionized our entire conception of life in these United States of America.

Where before people had to live within three miles of their place of business, they could now, with this cheap, fast means of transportation, live within thirty miles and get back and forth in approximately the same time. A great and rapid migration took place from the congested centres of population to the outlying suburbs. This required new homes, new roads, new sewers, extension of public utilities, such as light, telephone, power, gas; new stores, new banks, new theatres, new parks.

At the same time there was a great migration of people from the farms to the cities, intensifying this movement. Four million men had been taken out of their normal channels of existence and shown new sights and new scenes during the war. When they returned, the farm and the little village from whence they came looked small and unimportant. These men were restless, used to action and noise. They gravitated to the cities.

Upon the construction industry of this country fell the burden of meeting in this short space of time the needs of this tremendous migration.

We are inclined to believe that the depression began in the fall of 1929. Actually it began in 1927, for it was at that time that we had really caught up with the actual needs of the changing times.

In 1930, building permits in the city of Chicago dropped to $79,000,000; in 1931 to $46,000,000; and in 1932 to approximately $5,000,000.

Now I have taken your time to

give you this perspective of a cross-section of the construction industry because I do not believe that any of us can adequately prescribe a constructive policy for the future without a real understanding of the facts concerning the past. If you are looking to reconstruct exactly the good old days of 1920 to 1929, then I think you are seeking the impossible. Those conditions were absolutely abnormal. In my judgment they will not be produced again, because the cause that brought them forth will not again be operative in the same way.



Today general business activity is measured by the Annalist Index as, roughly, 58 per cent of the 1928 volume of business. Total construction of all classes in 1932 was valued at 18 per cent of the 1928 volume. And the decline continues into 1933.

However, during the past two or three years, home construction has barely been sufficient to take care of the losses by fire and obsolescence. The 350,000 new families created in every year have not been provided with new homes. This has been offset in part by the temporarily reduced standard of living that has forced thousands of families into unsatisfactory living quarters. The conditions of the last three years are not normal.

What, then, can we expect? I am not given to making predictions. But it seems logical that after what has taken place during the past three years, we must expect that it will require two or three more years gradually to work out of this depression. And then it would seem to me reasonable to expect a volume of construction necessary to take care of the normal growth of our population and its normal needs in terms of replacements of obsolescent structures and the requirements of rehabilitation and repair which are going to be of considerably more importance in the years that lie ahead than they have been in the past.

This seems the more logical when we consider that statistics clearly show that the ratio of population growth is slowing down.

But is this a pessimistic outlook for the construction industry? I do not think so. Rome has not fallen. It is simply changing.

The task that lies ahead is a more difficult one, but for those with vision and courage I believe that it offers an opportunity to build a more solid foundation upon which the construction industry of the future can profitably stand.

And now let me outline, in the briefest possible way, a suggested constructive policy for the construction industry.

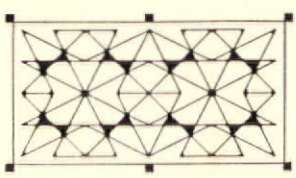
1. First, let every one extract from his mind the picture of the construction as it existed from 1920 to 1929. Let's replace that with a clear-cut and logical picture of what may be required and expected of the construction industry from 1935 to 1945.

2. Second, let's all determine to keep out of the figures and out of our minds the temporary and abnormal construction work of the Federal Government that may be done to alleviate unemployment and stimulate business. While this is a welcome addition in these times to the activities of the construction industry, it will only confuse us in laying our basic plans for the long-range future unless we keep this work in a separate category.

3. Let us recognize that for several generations in this country, the owning of a home or real estate was not only a mark of distinction and stability, but almost inevitably resulted in a profit. Today, thousands of people have lost their faith in real estate.

The construction industry must co-operate in clearing away the débris that has resulted from the unsound period that has gone before. We must lay a foundation that will again make the owning of real estate and the building of buildings a sound investment. We must then again prove to people that the owning of a home or an investment in real estate is a sound investment.

4. It is unfortunate that the construction industry is not better organized and better prepared today to take an active part in the reconstruction of our financial system in such a way that it would provide a sound uniform mortgage financing system. This is the keystone and the arch that, after the present depression is over, will help to bring the construction industry back on a sound basis. I suggest that the methods of handling mortgages in France might be helpful to us in this country.



In this connection, the Federal Home Loan Bank System, which was authorized by Congress a year ago and is only now beginning to get into operation, is a real start in the right direction. The plan itself is not yet perfected. But what it needs more than anything else is real leadership and vision. The plan itself can be moulded to meet the needs of the country. The foundation, however, has been laid.

The construction industry should recognize clearly that the building of a sound construction, financing, and mortgage loan structure for the future must be done to attract new capital into this field and to re-establish the confidence of the ultimate purchaser.

5. And then, when we have gotten ourselves out of this depression and laid a sound foundation for the future, we must all concentrate our efforts on evolving a new type of construction for the future. We must find a way to build better and cheaper homes and buildings for the future. The example set by the automobile industry in giving greater value for less money must be followed by the construction industry.



I do not suggest that we attempt to revolutionize the methods of building over night. But the old traditions and the old methods must change. If the labor rates for erection on the job cannot be greatly reduced, then we must find means of altering the methods of erection. If we cannot reduce the total cost with the use of present types of materials, then we must find ways to create new materials.

It is in this direction that opportunity lies. In my judgment the architects of this country must lead the way. Many of the manufacturers have been working in this direction for several years. In my judgment it is in this direction that the real future of the construction industry lies.

THE EIGHTIETH IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

# ARCHITECTURE'S PORTFOLIO OF EAVES RETURNS ON MASONRY GABLES

*Subjects of previous portfolios are listed below at left and right of page*



1926
- DORMER WINDOWS
- SHUTTERS AND BLINDS

1927
- ENGLISH PANELLING
- GEORGIAN STAIRWAYS
- STONE MASONRY TEXTURES
- ENGLISH CHIMNEYS
- FANLIGHTS AND OVERDOORS
- TEXTURES OF BRICKWORK
- IRON RAILINGS
- DOOR HARDWARE
- PALLADIAN MOTIVES
- GABLE ENDS
- COLONIAL TOP-RAILINGS
- CIRCULAR AND OVAL WINDOWS

1928
- BUILT-IN BOOKCASES
- CHIMNEY TOPS
- DOOR HOODS
- BAY WINDOWS
- CUPOLAS
- GARDEN GATES
- STAIR ENDS
- BALCONIES
- GARDEN WALLS
- ARCADES
- PLASTER CEILINGS
- CORNICES OF WOOD

1929
- DOORWAY LIGHTING
- ENGLISH FIREPLACES
- GATE-POST TOPS
- GARDEN STEPS
- RAIN LEADER HEADS
- GARDEN POOLS
- QUOINS
- INTERIOR PAVING
- BELT COURSES
- KEYSTONES
- AIDS TO FENESTRATION
- BALUSTRADES

*Below are the subjects of forthcoming Portfolios*

Exterior Lettering
JULY

Entrance Driveways
AUGUST

Corbels
SEPTEMBER

Pew Ends
OCTOBER

Gothic Niches
NOVEMBER

Curtain Treatment at Windows
DECEMBER

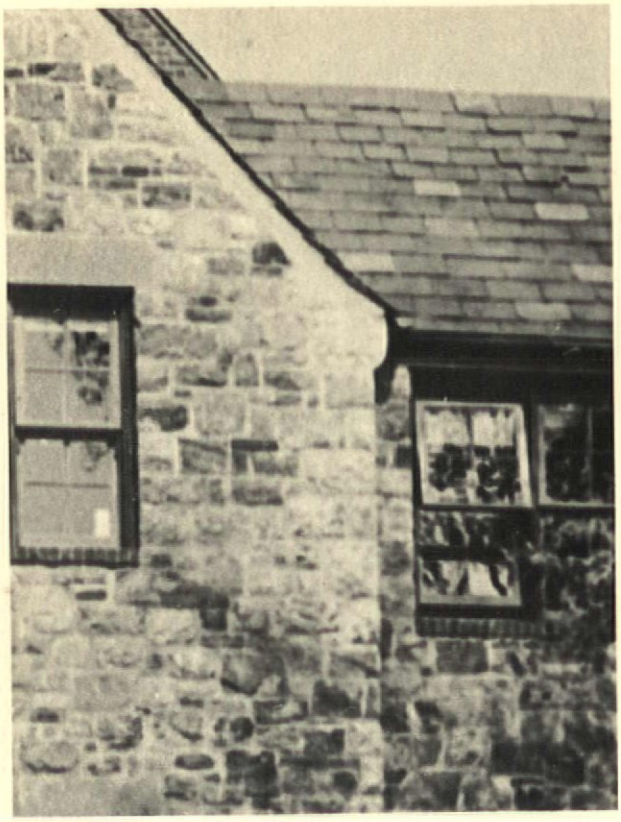
*Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up about six weeks in advance of publication date.*

1930
- SPANDRELS
- CHANCEL FURNITURE
- BUSINESS BUILDING ENTRANCES
- GARDEN SHELTERS
- ELEVATOR DOORS
- ENTRANCE PORCHES
- PATIOS
- TREILLAGE
- FLAGPOLE HOLDERS
- CASEMENT WINDOWS
- FENCES OF WOOD
- GOTHIC DOORWAYS

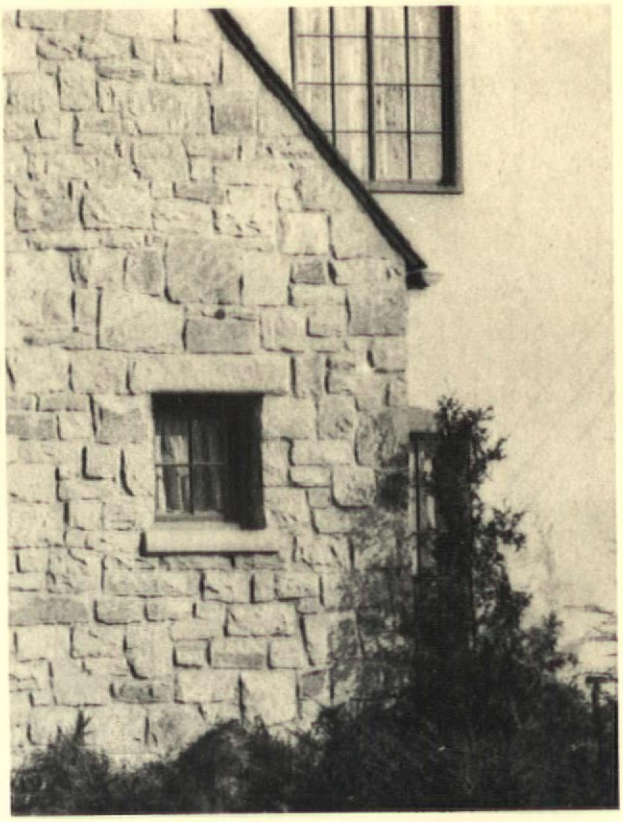
1931
- BANKING-ROOM CHECK DESKS
- SECOND-STORY PORCHES
- TOWER CLOCKS
- ALTARS
- GARAGE DOORS
- MAIL-CHUTE BOXES
- WEATHER-VANES
- BANK ENTRANCES
- URNS
- WINDOW GRILLES
- CHINA CUPBOARDS
- PARAPETS

1932
- RADIATOR ENCLOSURES
- INTERIOR CLOCKS
- OUTSIDE STAIRWAYS
- LEADED GLASS MEDALLIONS
- EXTERIOR DOORS OF WOOD
- METAL FENCES
- HANGING SIGNS
- WOOD CEILINGS
- MARQUISES
- WALL SHEATHING
- FRENCH STONEWORK
- OVER-MANTEL TREATMENTS

1933
- BANK SCREENS
- INTERIOR DOORS
- METAL STAIR RAILINGS
- VERANDAS
- THE EAGLE IN SCULPTURE



*James Renwick Thomson*

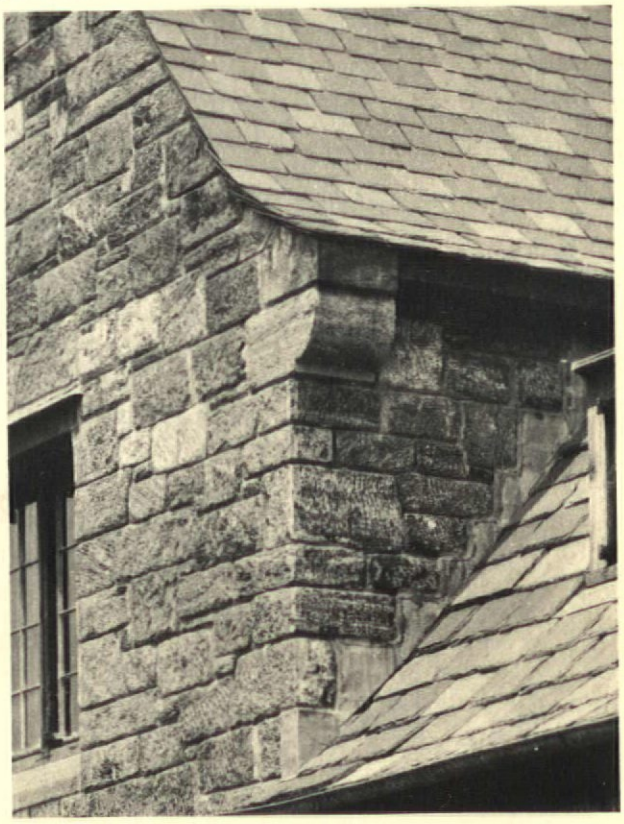


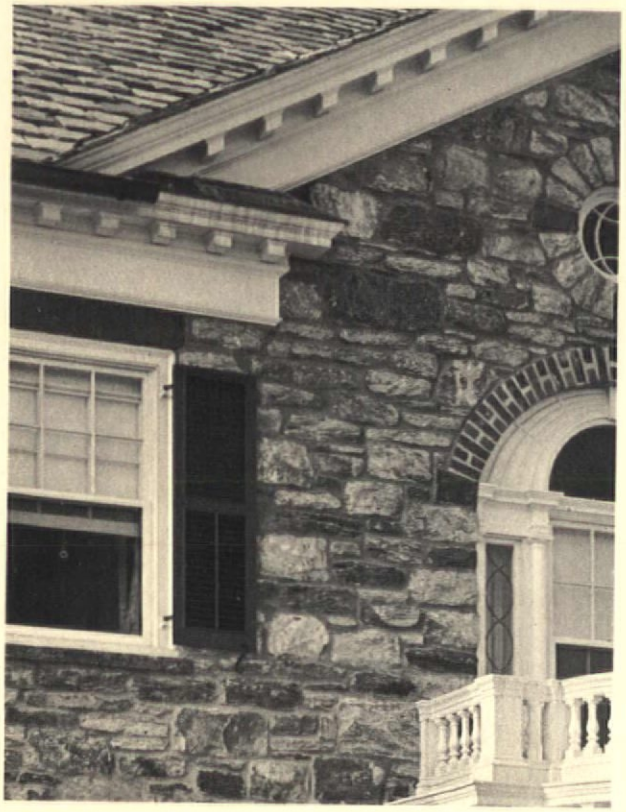
*Eugene Lang*

*Linn Kinne*

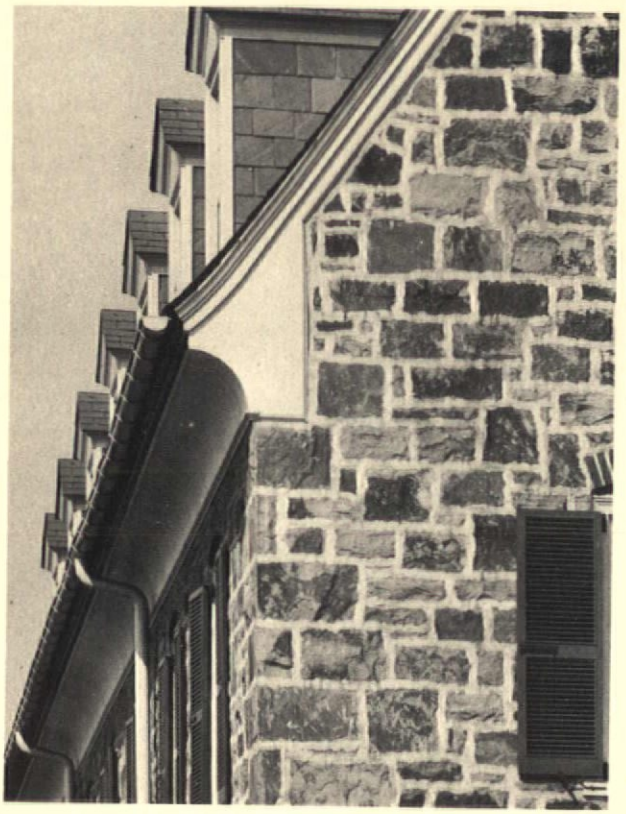


*John Oakman*



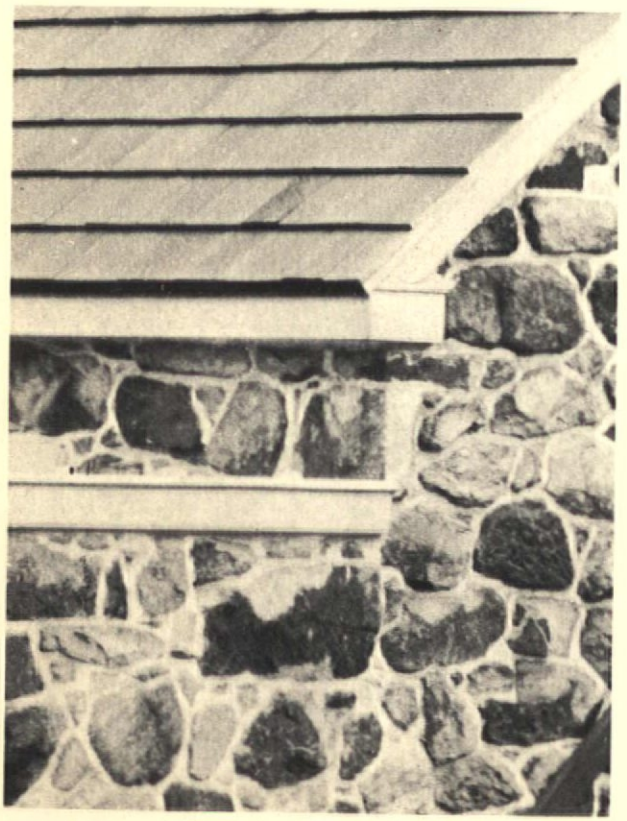


*H. W. Rowe Associates*

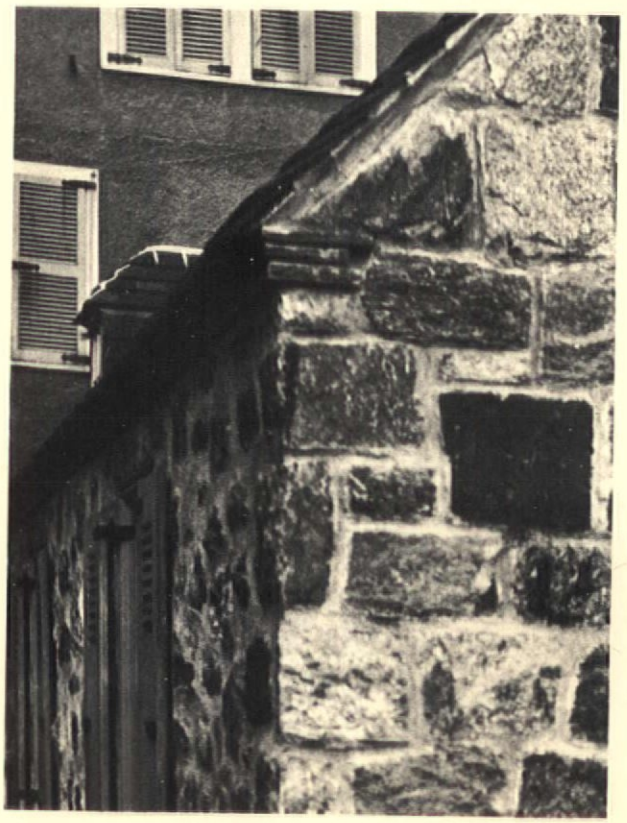


*Karl Snyder*

*R. Brognard Okie*



*Wesley S. Bessell*





*Bertram G. Goodhue*



*Richard Powers*

*Wesley S. Bessell*

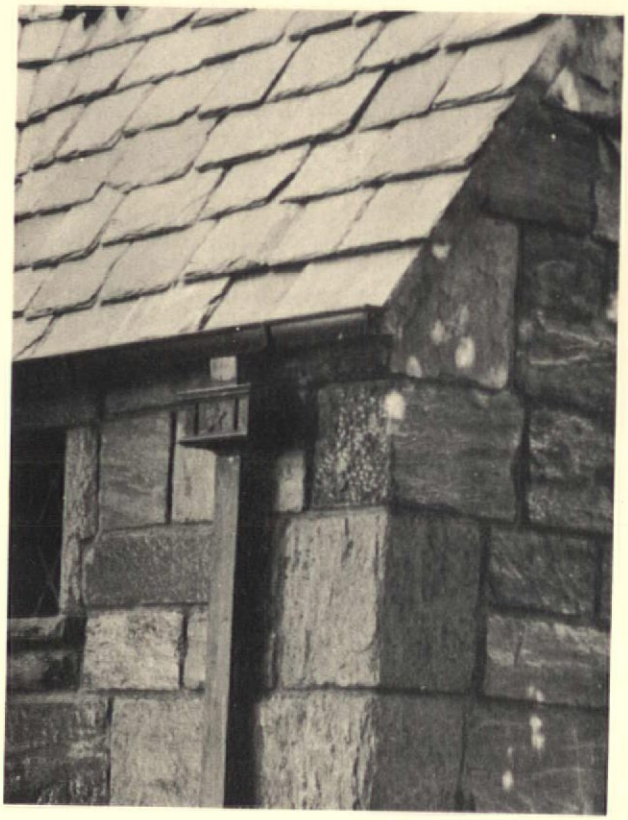


*Alfred Mausolff*



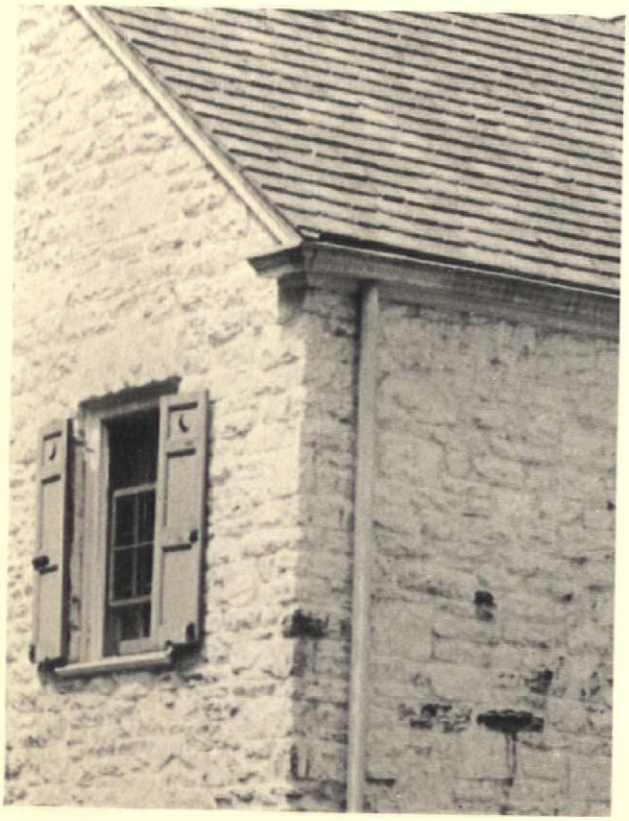


*Henry Powers*

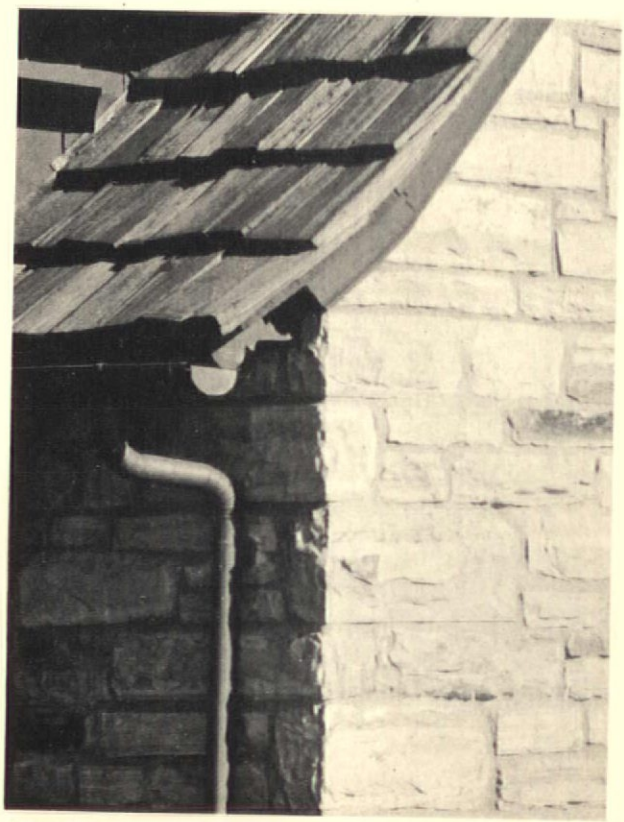


*Walter T. Karcher & Livingston Smith*

*Electus D. Litchfield*

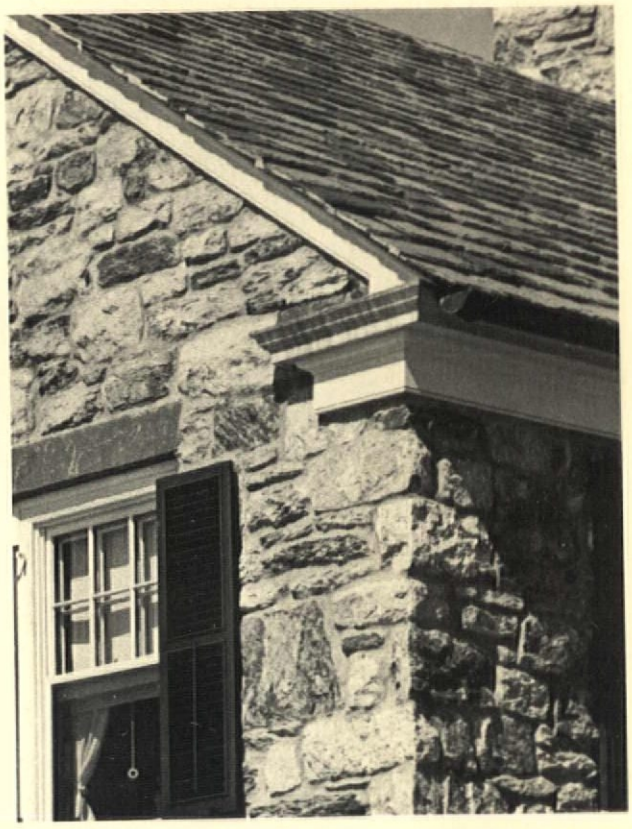


*Paul R. Williams*





*Warren, Knight & Davis*



*H. W. Rowe Associates*

*Clifford C. Wendehack*



*Brutus Gundlach*





*Walter Bradnee Kirby*



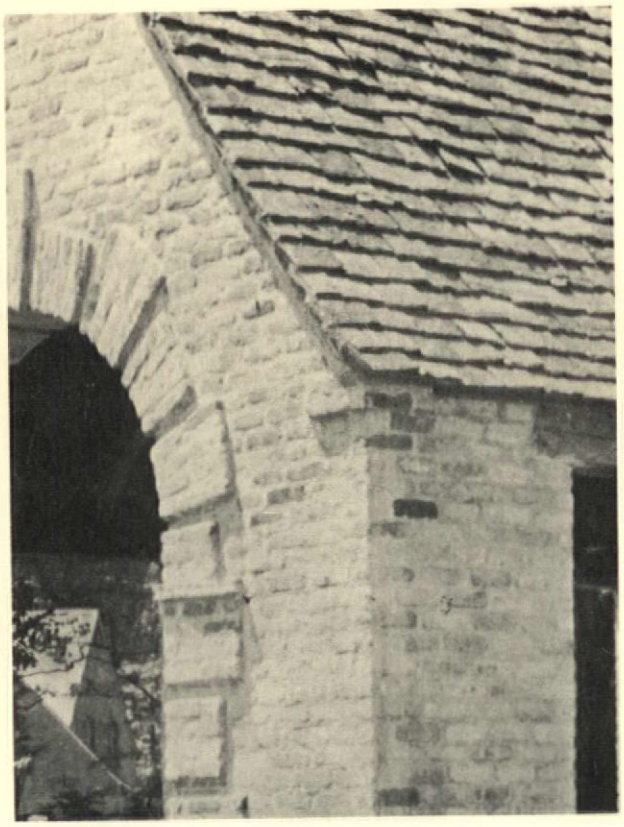
*Leland Hubbell Lyon*

*In Gloucestershire, c. 1640*



*Frank J. Forster*



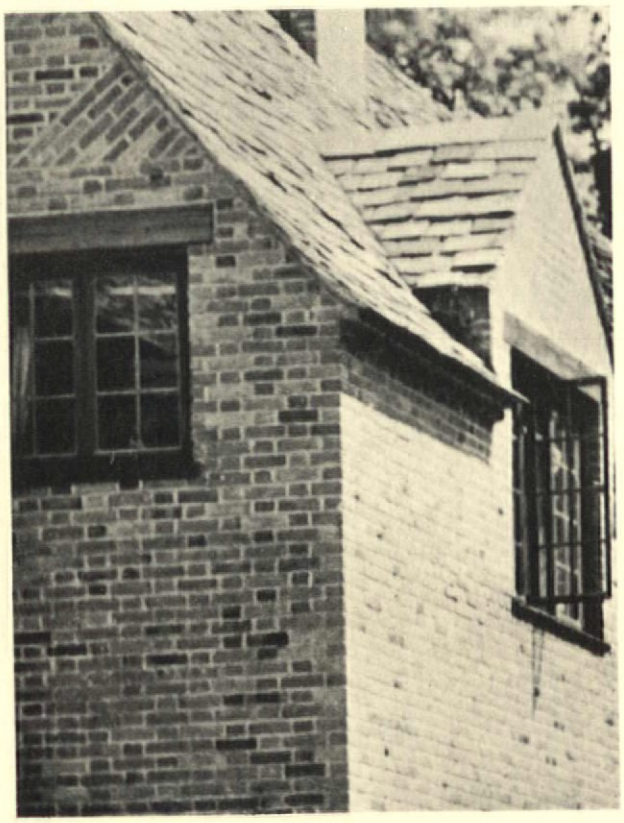


*Frank J. Forster, R. A. Gallimore*

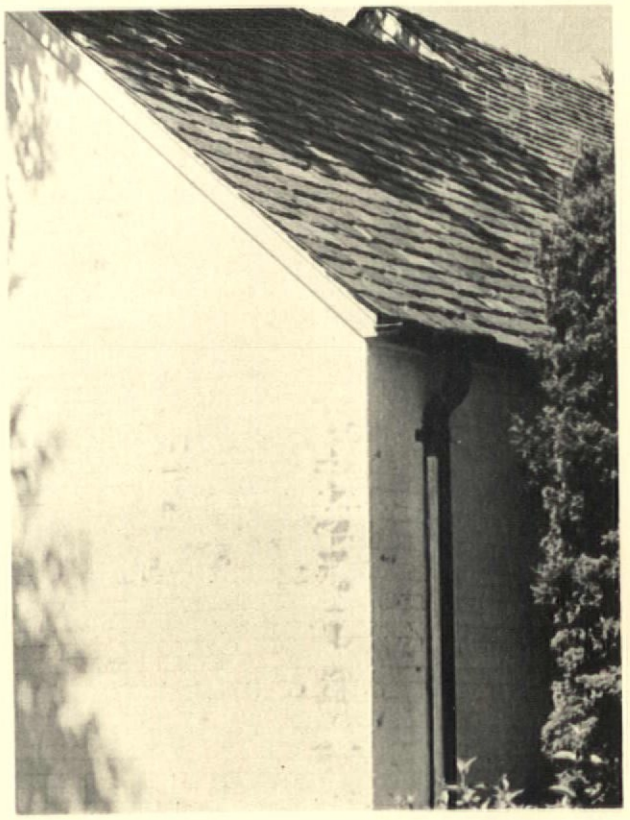


*Richard H. Dana, Jr.*

*Peabody, Wilson & Brown*



*James W. O'Connor*



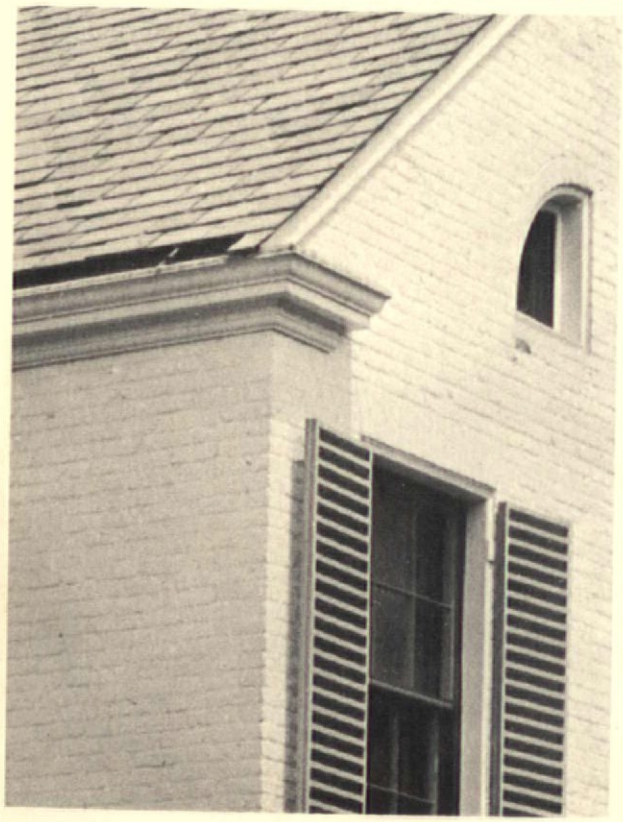



*Guilbert & Betelle*

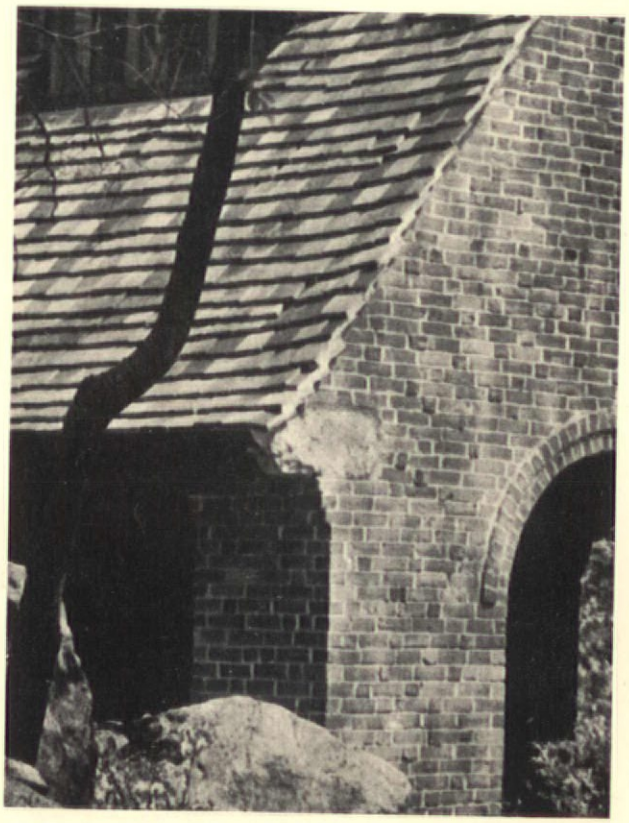


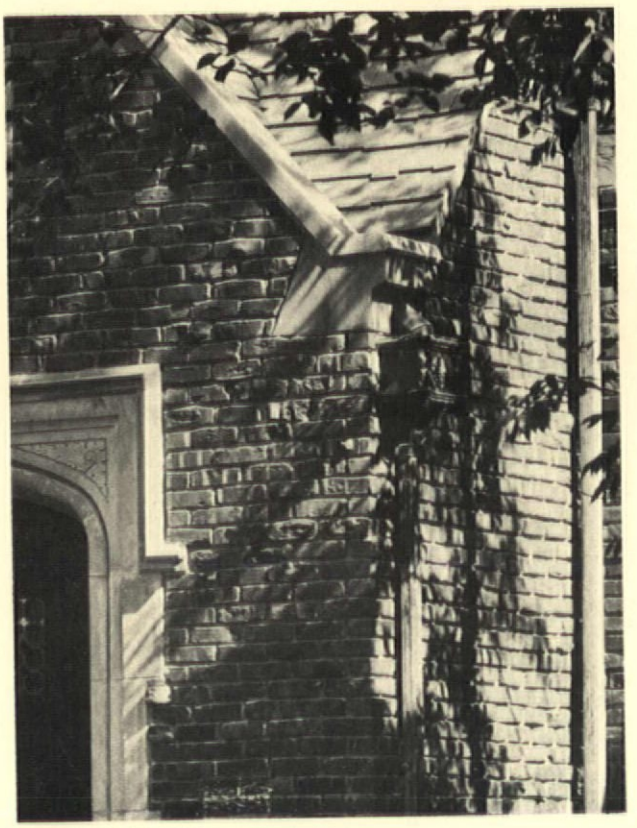
*LeRoy P. Burnham*

*John M. Bell*

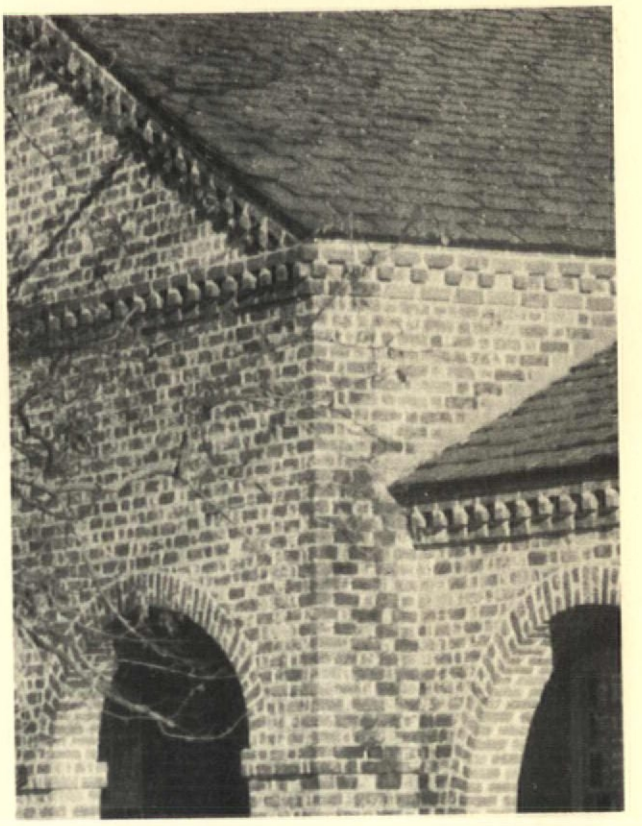


*Julius Gregory*





*J. Ivan Dise*

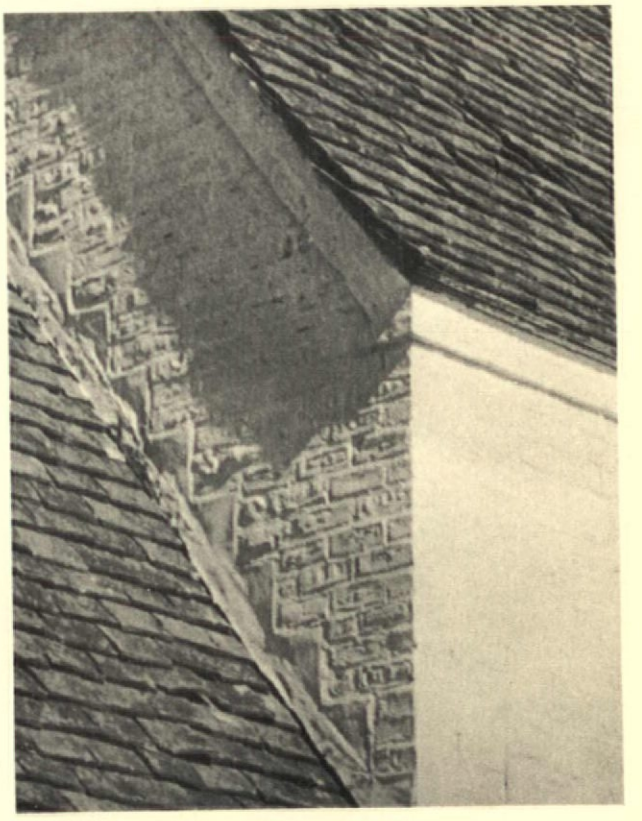


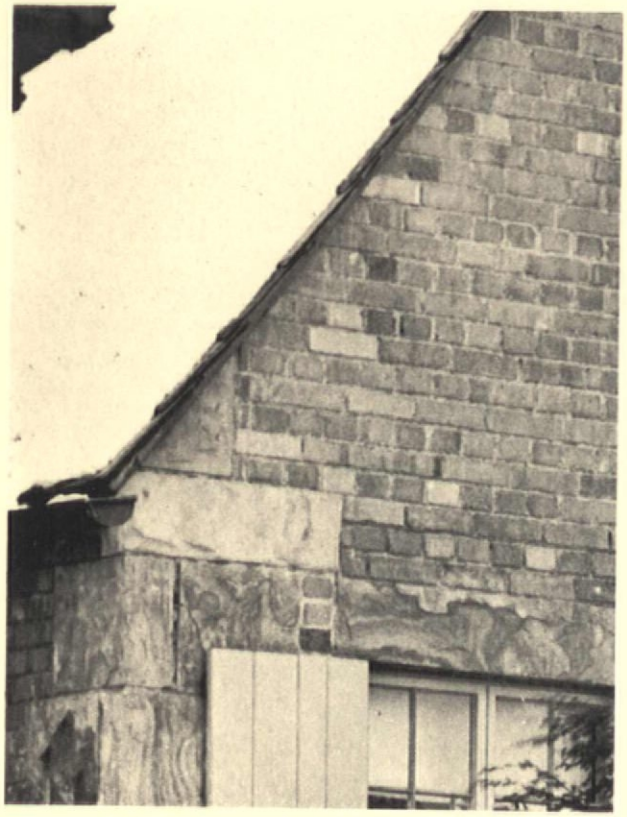
*W. Duncan Lee*

*Dunn & Copper*



*Frank J. Forster, R. A. Gallimore*



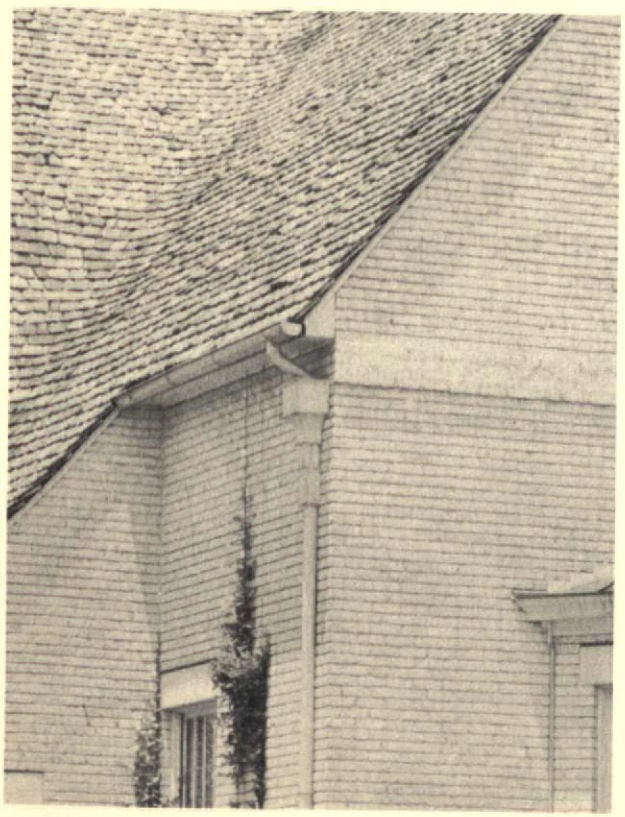


*Andrew J. Thomas*



*Washington's Headquarters, Fredericksburg, Va.*

*Hentz, Adler & Schutze*

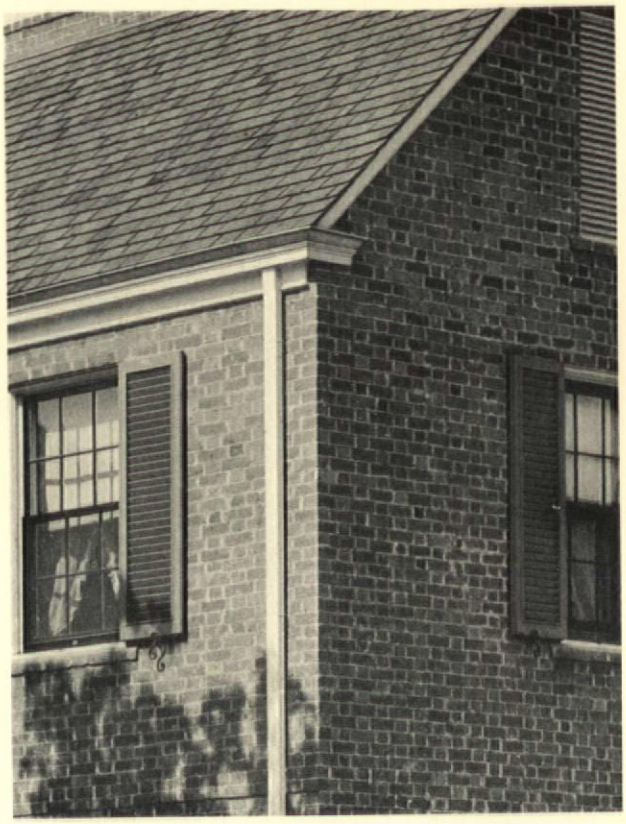


*Bertram G. Goodhue*



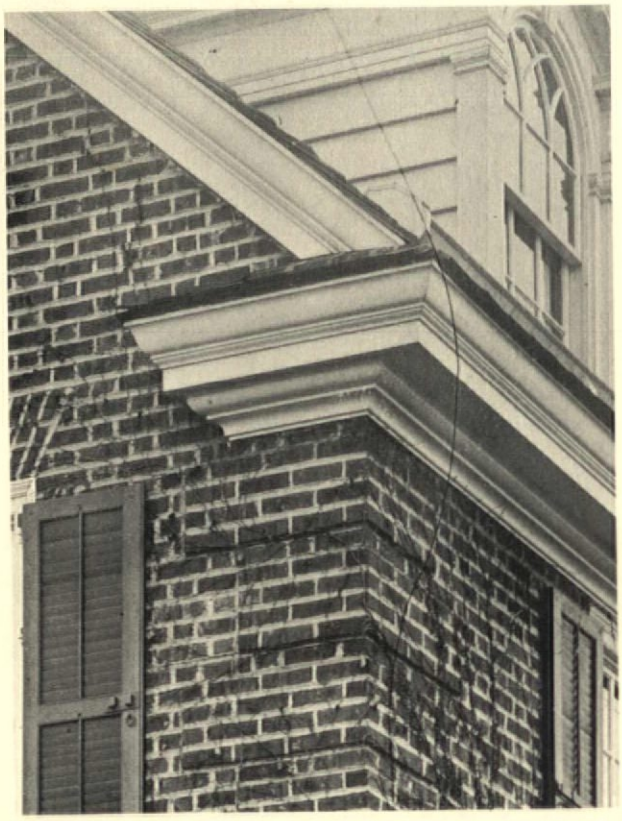


*Olive Tjaden*



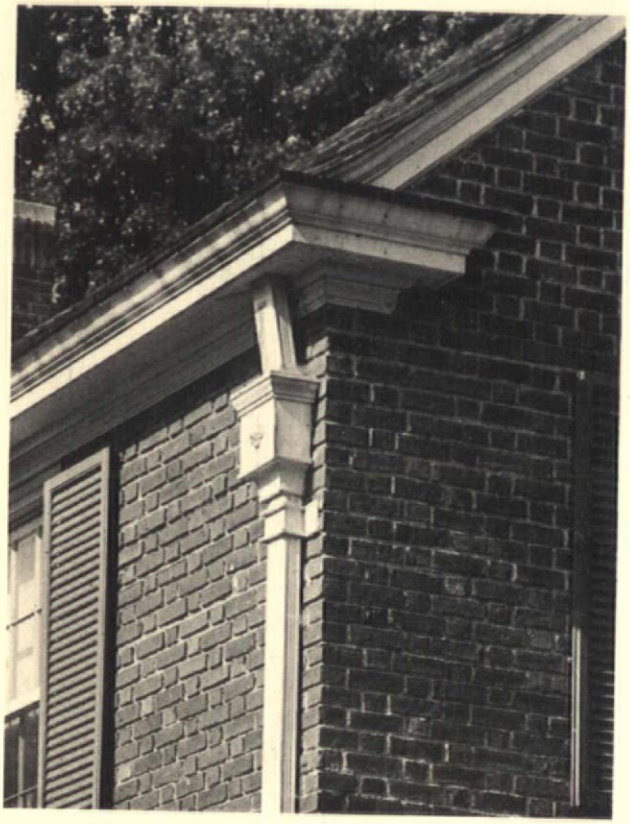
*Edmund B. Gilchrist*

*Wood cornice over brick quoins*



*Wood cornice and the gable parapet*



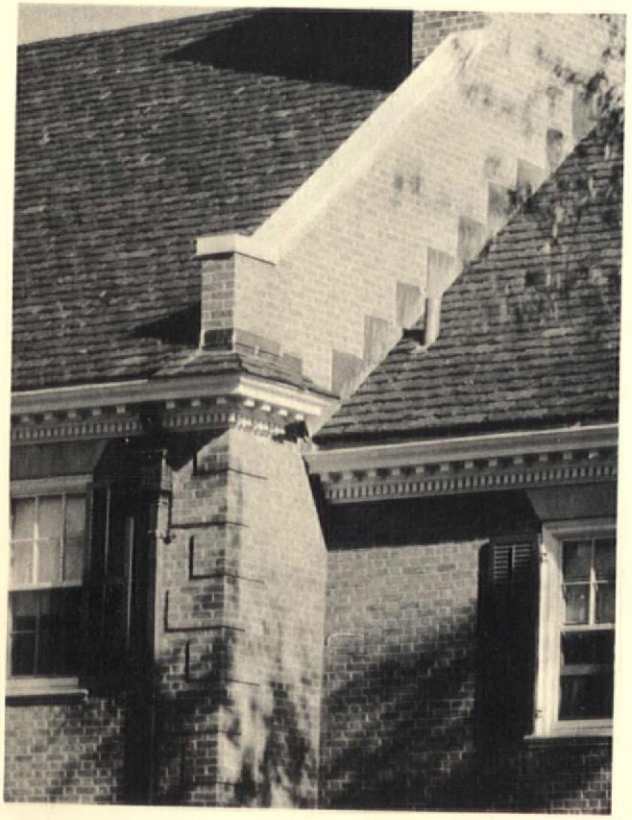


*Dwight James Baum*



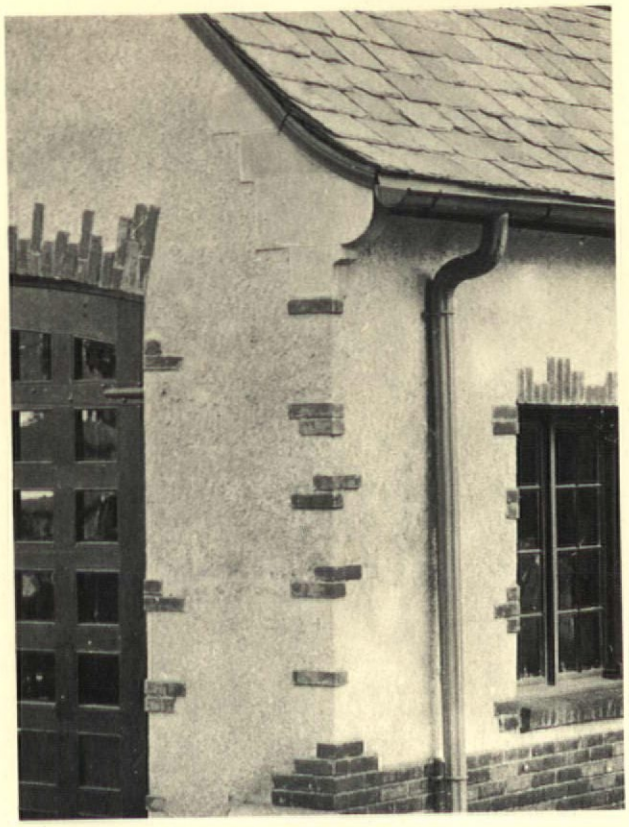
*H. M. Woolsey*

*Slee & Bryson*

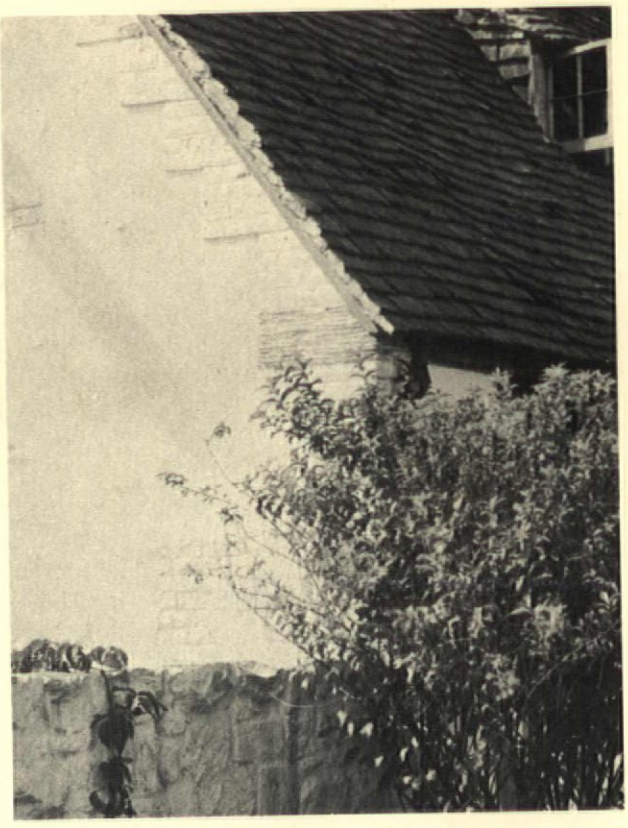


*Aymar Embury II*





*Schenck & Williams*



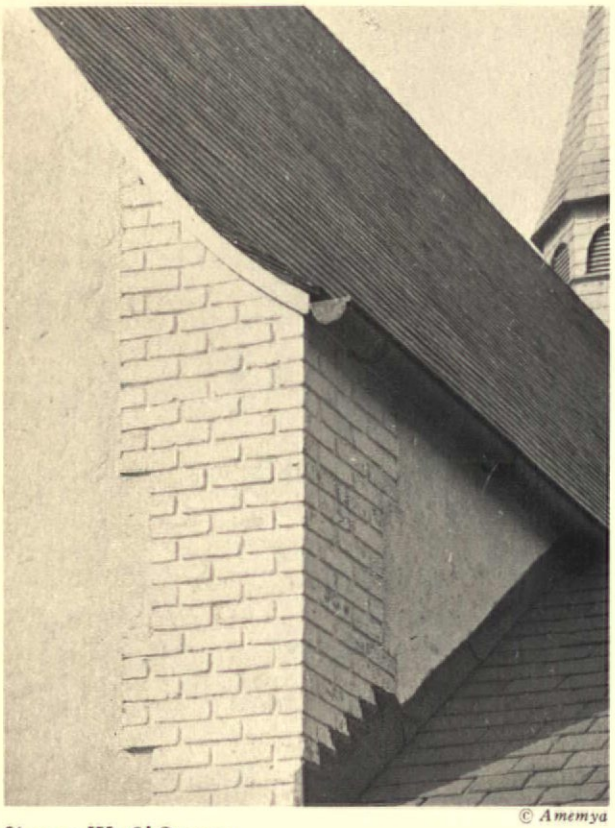
*Greville Rickard*

*Roger H. Bullard*



*Near Bellac, France*





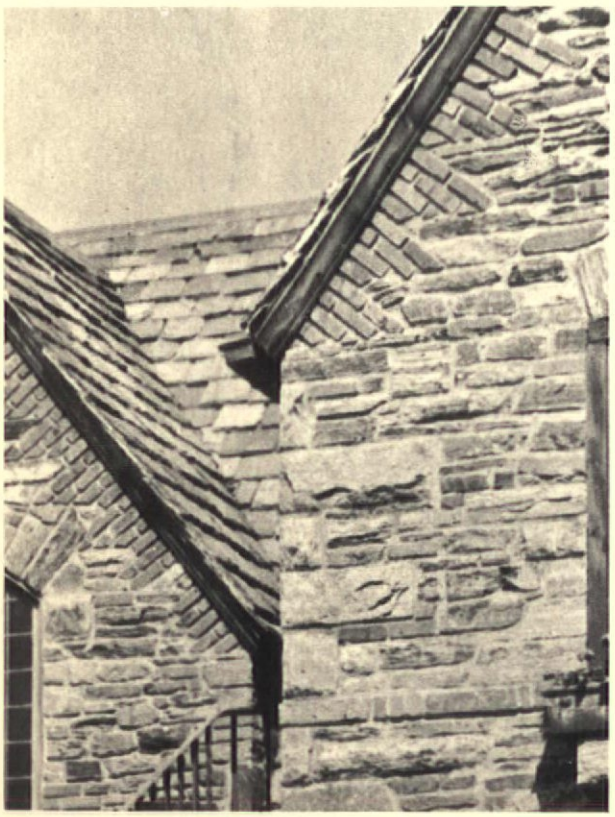
© Amemya

*James W. O'Connor*



*George D. Mason & Company*

*Office of John Russell Pope*



*Greville Rickard*





*Moise H. Goldstein*



*William Heyl Thompson*

*Sulgrave Manor, England* *Adams & Adams*

